Illinois State Water Survey Division
SURFACE WATER SECTION

SWS Contract Report 492

FEASIBILITY OF REHABILITATION OF THE ILLINOIS AND MICHIGAN CANAL AT LOCKPORT, ILLINOIS

by Misganaw Demissie and Renjie Xia

Prepared for the
Illinois Department of Conservation
Gary McCandless, Project Manager

Champaign, Illinois
June 1990

Illinois Department of Energy and Natural Resources

FEASBILITY OF REHABILITATION OF THE ILLINOIS AND MICHIGAN CANAL AT LOCKPORT, ILLINOIS

by

Misganaw Demissie, P.E., Ph.D., Senior Professional Scientist, and
Renjie Xia, M.S., Graduate Research Assistant

Illinois State Water Survey
2204 Griffith Drive
Champaign, Illinois 61820-7495

Prepared for the Illinois Department of Conservation
Gary McCandless, Project Manager

CONTENTS

INTRODUCTION

The Illinois and Michigan (I & M) Canal was constructed by the state of Illinois in the mid-1800s to link Lake Michigan to the Illinois River and eventually to the Mississippi River for navigational purposes. Construction of the canal started in 1836 and was completed in 1848. The route of the canal generally followed that of the Des Piaines River in its eastern portion and the Illinois River in its western portion, as shown in figure 1. The canal extended from the south branch of the Chicago River in Chicago to the Illinois River at LaSalle-Peru for a total length of 96.4 miles. The original canal cross section was designed for the most part with a 36-foot bottom width, a 60-foot water-line width, and a 6-foot depth, as shown in figure 2. The canal had 15 locks to regulate water levels and four aqueducts to pass over streams and rivers. It also had four feeders to supply water to the canal and maintain adequate depth for navigation. For many decades the canal was an important commercial thoroughfare; but navigation in the canal eventually declined and finally was terminated in 1933 after the opening of the Chicago Sanitary & Ship Canal and the construction of a series of locks and dams on the Illinois River in the early 1900s, which permitted the opening of the Illinois Waterway (Demissie and Stephanatos, 1986; Illinois Department of Conservation, 1948; Illinois Division of Waterways, 1951; Howe, 1956).

In 1984 the Illinois and Michigan Canal was designated a National Heritage Corridor by the federal government because of its historical significance and the strong local interest in preserving, rehabilitating, and restoring it. The canal is now managed as a historical and recreational corridor by the state. Local groups and the state want to maintain some flowing water in the canal for recreational purposes and to improve the aesthetics of the historical canal. However, the canal has not been maintained for a very long time, and in some places it has been completely filled in with sediment. At the present time none of the major hydraulic controls of

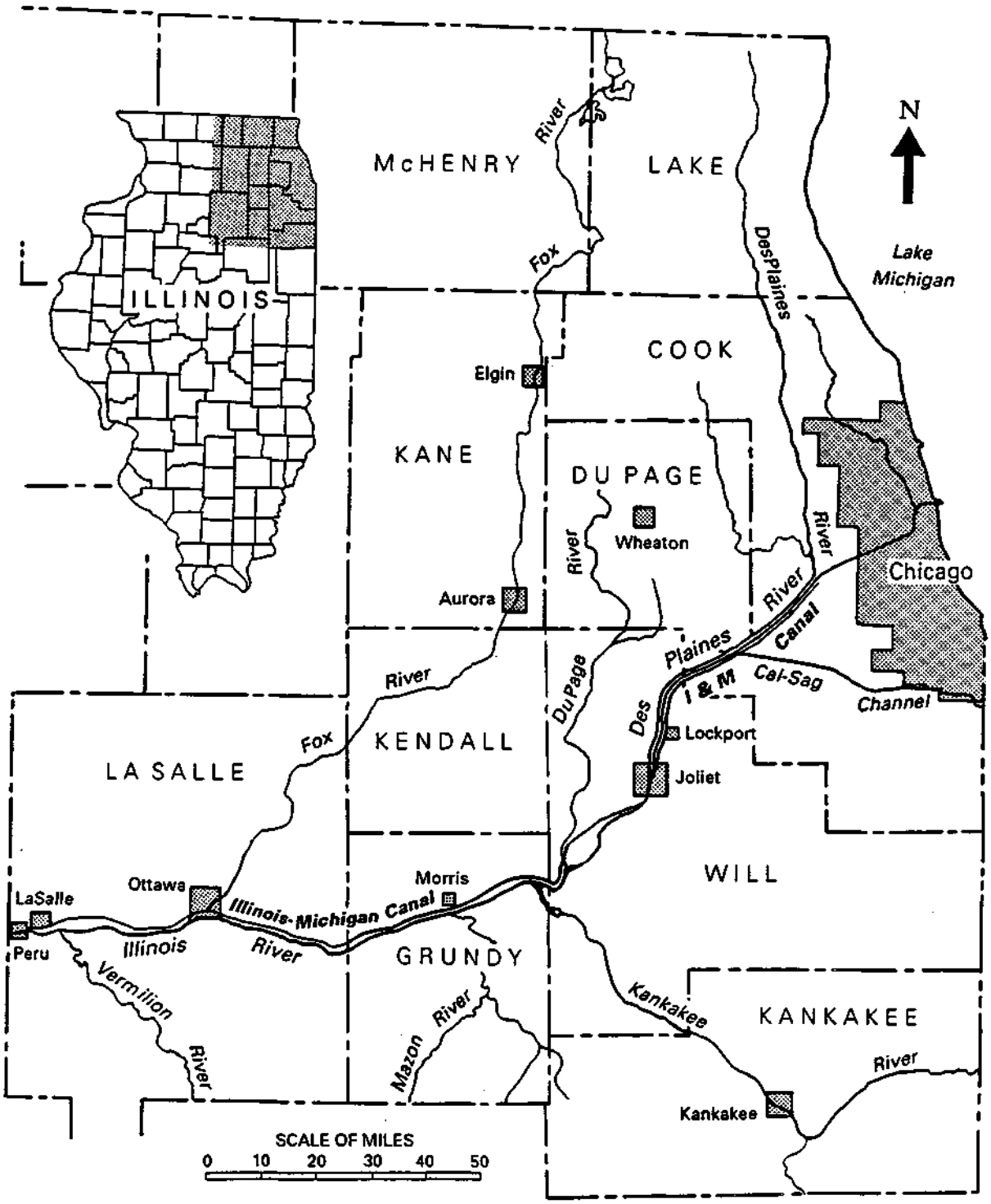


Figure 1. Location of the Illinois and Michigan Canal

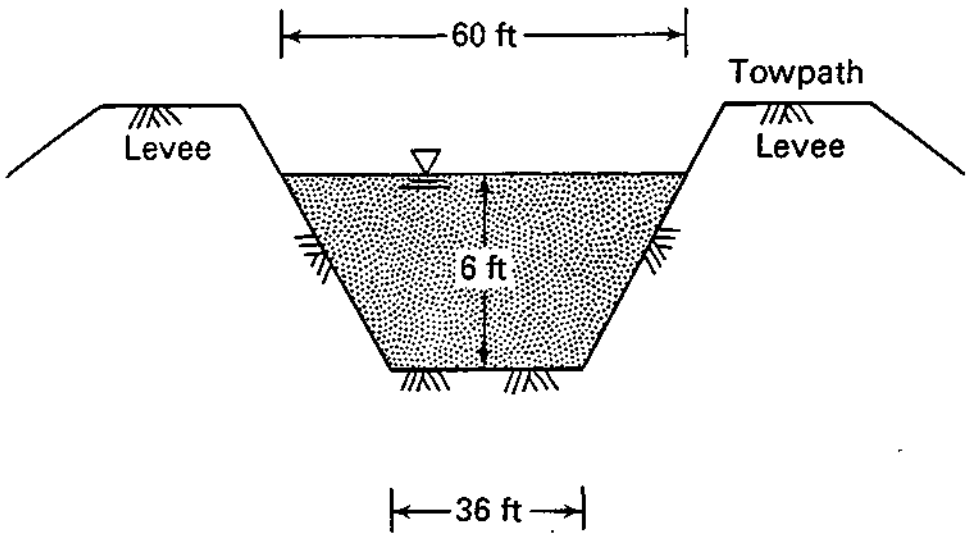


Figure 2. Typical design cross sectlon of the Illinois and Michigan Canal

the original canal are in Operation. Furthermore most of the small streams in the region drain either into or through the canal, causing flooding problems in some areas.

It is obvious that what remains of the old canal is not the same as the canal that was designed and built for navigation. Significant changes have taken place in both the canal and the surrounding areas. Therefore it is very important that an evaluation of the present conditions of the canal and the feasibility of any hydraulic works to rehabilitate the canal be conducted before any major rehabilitation work is initiated in the canal.

Objective of the Study

The main objective of this study was to conduct a preliminary feasibility study to investigate the hydraulics and hydrology of the canal and the streams that drain into it, and to evaluate the potential for rehabilitating the canal in the Lockport area. The major areas of concern include water supply to maintain sufficient depth, flooding adjacent to the canal, Sedimentation within the canal, and the potentials and problems of rehabilitating the banks of the canal.

Scope of the Study

The reach of the canal that is of primary interest at present, shown in the aerial photo foldouts after page 41 of this report, extends from Joliet where the canal joins the Des Piaines River to the Texaco refinery northwest of Lockport. A control structure at the refinery, known as the Texaco dam, was first agreed upon as the northern limit of the study area. It was assumed that a regulated flow will enter the canal at the control strueture; therefore the influence of tributary streams upstream of this control strueture on the hydraulics of the canal was not to be investigated. However, it was later determined that water flow control and modifications at and

upstream of the Texaco dam are the most important tasks in the future rehabilitation of the canal. Therefore, for the purposes of this report, the study area was extended up to the mouth of Long Run at the upstream end of the Texaco property.

Acknowledgements

This work was accomplished as part of the regular work of the Illinois State Water Survey under the administrative guidance of Richard G. Semonin, Chief; Michael L. Terstriep, Head of the Surface Water Section; and Nani G. Bhowmik, Assistant Head of the Surface Water Section.

The work upon which this report is based was supported in part by funds provided by the Illinois Department of Conservation (IDOC) with Gary McCandless as project manager.

William C. Bogner, a native of Lockport and an Associate Professional Scientist at the Water Survey, assisted in field reconnaissance and formulation of the study. Kathleen Brown typed the report, Gail Taylor edited it, and John Brother and Linda Riggin prepared the illustrations.

DRAINAGE

Historically the drainage of tributary streams into the Illinois and Michigan Canal has been a source of major problems, generally associated with flooding. Since the canal was not originally designed as a flood-conveying canal, tributary drainage into the canal has resulted in overtopping or breaks of the levees, which have led to flooding of adjacent lands and properties. In many cases the presence of the canal provided flood protection for adjacent areas during periods of low to medium floods. However, when major floods overtop the levees or when a levee break occurs, the canal is blamed for the flooding. Since whoever manages the canal is also responsible for maintaining the natural drainage without increasing the flooding problems to adjacent lands and properties, it is important to examine the expected drainage into the I & M Canal in the Lockport area.

The tributary streams that drain into the I & M Canal in the Lockport area and their drainage areas are shown in figure 3. The names of the streams and the sizes of their drainage areas are given in table 1. Five streams drain directly into the I & M Canal in the study area. Their total drainage area is 41 Square miles (sq mi). Long Run is the largest stream, with a drainage area of 25.5 sq mi. Big Run is the smallest, with 2.2 sq mi of drainage area. It enters the canal at the Gaylord Building, about one-half mile upstream of Lock 1. Big Run and Fiddyment Creek drain the area south of Long Run and north of Milne Creek. Both streams enter the I & M Canal within the Texaco plant. Fraction Run drains the area south of Milne Creek and joins the I & M Canal about 1,500 feet upstream of Lock 2.

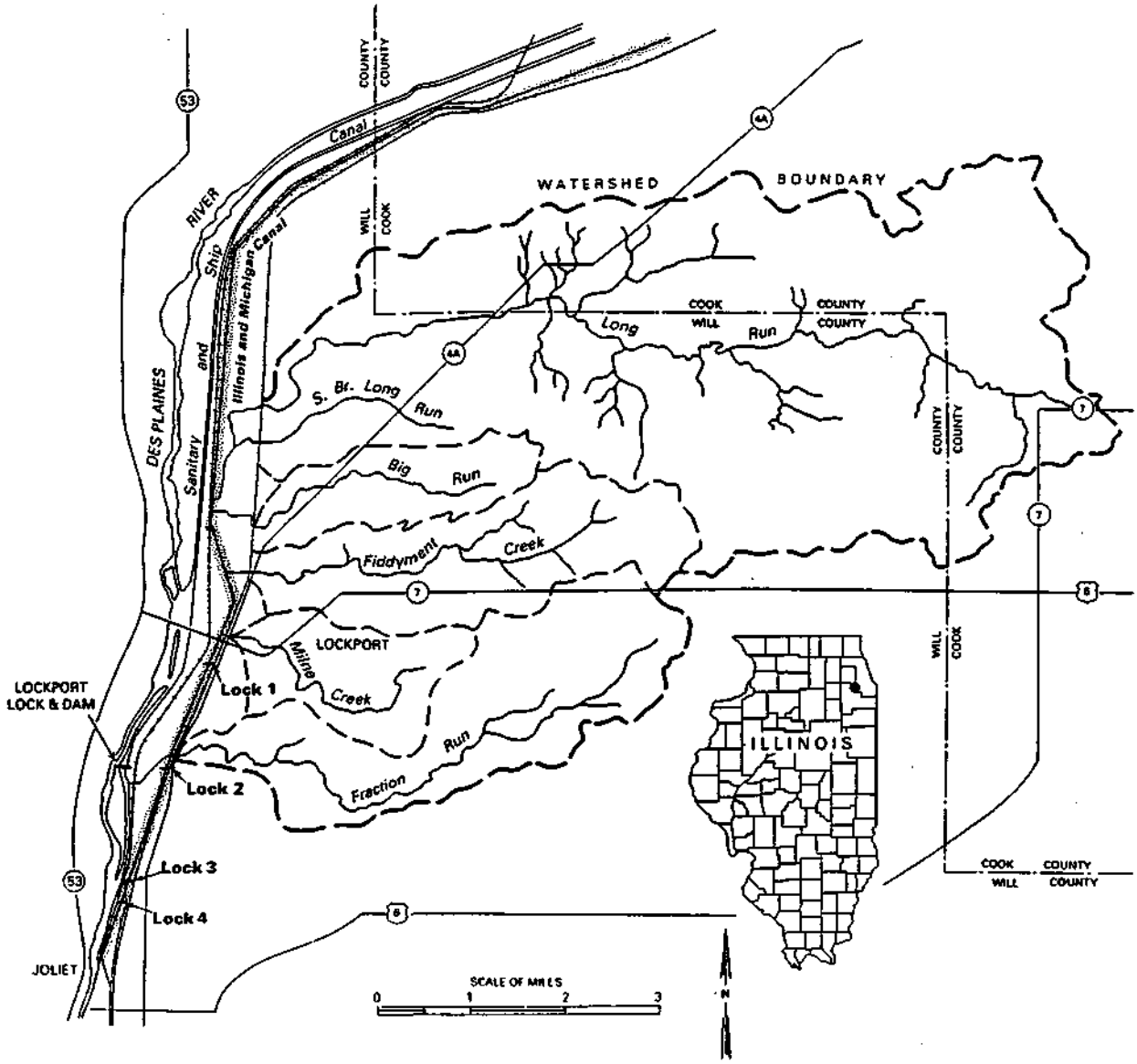


Figure 3. Watersheds of tributary streams draining into the Illinois and Michigan Canal within the study area

Table 1. Characteristics of Streams That Drain into the I & M Canal in the Lockport Area

Name of stream	*Drainage area (sq mi)*	*Stream length (mi)*	*Average stream slope (ft/mi)*
Long Run	25.5	11.9	11.5
Big Run	2.2	4.4	43.1
Fiddyment Creek	4.8	5.2	34.0
Milne Creek	2.3	3.6	44.2
Fraction Run	6.2	7.4	26.2

One of the major sources of the problems associated with the tributary streams is their steep gradients. Since the streams drain the bluff area of the Des Piaines floodplain, they have very high gradients, ranging from 11.5 to 44.2 ft/mi before they enter the canal. The profiles of the streams are shown in figure 4, and their average gradients are given in table 1. Streams with such steep slopes generally have higher peak flows and tend to carry more sediment than streams with moderate or low slopes. Therefore during major storms, most of these streams deliver their floodwaters and sediment to the I & M Canal very quickly, causing flooding problems. The I & M Canal was not designed to handle the floodwaters from all the tributary streams, and it cannot do so without major modifications. Therefore, to prevent flooding in the I & M Canal, it is important to have controlled overflow structures in the canal so that floodwaters overflow into Deep Run (as is presently done at the upstream end of the Texaco plant and upstream of Lock 1 in Lockport) and eventually to the Chicago Sanitary & Ship Canal.

Deep Run is the main drainage Channel between the I & M Canal and the Sanitary & Ship Canal. It runs almost parallel to the Sanitary & Ship Canal on the east side and joins it just downstream of the Lockport Locks & Dam. Deep Run can be easily identified in the aerial photo foldouts after page 41 of this report.

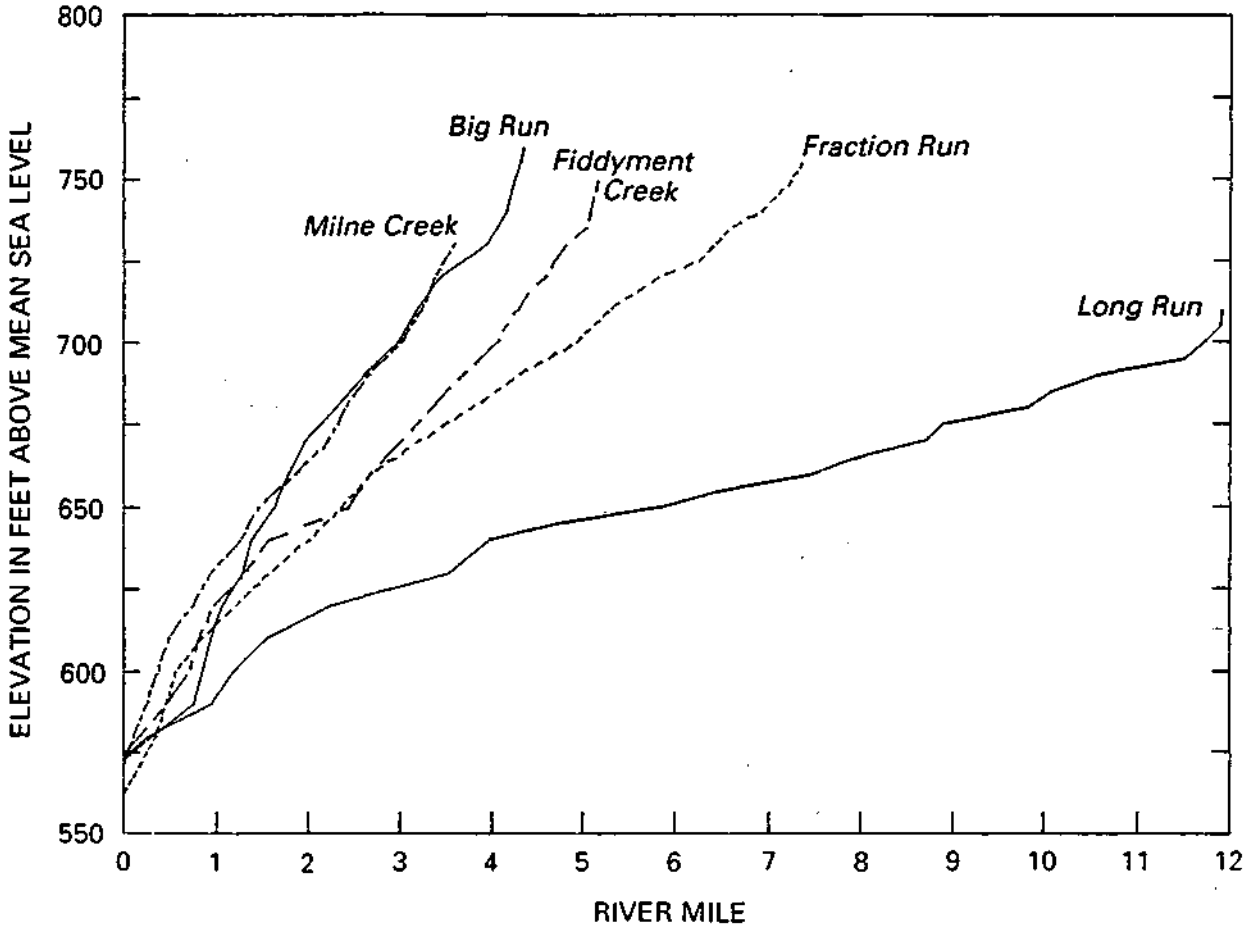


Figure 4. Profiles of tributary streams in the study area

PHYSICAL CONDITION OF THE CANAL

The **I** & M Canal in the study area has essentially been abandoned over the years and has not been maintained as either a navigation channel or a drainage Channel. Because of the absence of maintenance, the canal is not in good condition. Any rehabilitation project has to determine the existing condition of the canal and evaluate what has to be done to restore or rehabilitate it. To assess the existing physical conditions, a detailed survey of the canal was conducted by Baird & Company in 1989 under contract with the Illinois Department of Conservation (Baird & Company, 1989). The survey included 51 cross-sectional profiles across the canal and the main tributary streams from Joliet to the Texaco plant north of Lockport. The results of the survey are included in this report as Appendix B.

Survey Results

The 1989 cross-sectional profiles were compared to similar cross-sectional profiles surveyed in 1949 by the Illinois Division of Waterways, Department of Public Works and Buildings, to assess the changes in the canal over the years. Copies of the 1949 cross-sectional survey were obtained from the Illinois Department of Transportation, Division of Water Resources (Illinois Division of Waterways, 1950).

The results of the comparison are shown in Appendix A, which presents the cross-sectional profiles based on the 1989 survey (solid lines) and those based on the 1949 survey (dashed lines) for 18 cross sections. The cross sections shown in the appendix can be divided into four groups. Cross sections A-l through A-4 are located in the segment of the canal downstream of Lock 4. Cross sections A-5 through A-8 are located between Locks 3 and 2. Cross sections A-9 and A-10 are located between Locks 2 and 1. Cross sections A-ll through A-18 are all located upstream of Lock 1.

The last three cross sections (A-16 through A-18) are located upstream of the Texaco dam.

In general, it can be concluded that major physical changes have not taken place in the canal cross sections since 1949 except in the upper and lower ends of the study reach. Near the downstream end, where the canal joins the Des Piaines River, there has been significant sediment accumulation as indicated in figure A-l for the cross section at River Mile 0.654. Farther upstream, changes in canal cross sections are not significant except in cross section A-8 at River Mile 2.029 just downstream of Lock 2. Here again there is significant sediment accumulation. For the canal segment between Lock 1 and Lock 2, the changes in the cross sections are not significant. For the segment upstream of Lock 1, the changes are nominal up to the Texaco dam. Upstream of the dam, sediment has been accumulating as indicated by cross sections A-16, A-17, and A-18.

Sedimentation

One of the major problems with the I & M Canal has been the accumulation of sediment in the canal prism. Soil eroded from the watersheds of the tributary streams is washed into the canal. Since the slopes of the tributary streams are very steep, the flow velocities in the stream Channels during storm events are high enough to carry all the sediment downstream into the canal. Once the flow enters the canal, flow velocities are reduced significantly since the gradient of the canal itself is nearly horizontal. As the flow velocities in the canal are reduced, most of the sediment settles out in the canal. In 1951 the Division of Waterways reported a sediment accumulation of up to 8 feet in segments of the canal. Sediment accumulation has continued since then, with some areas experiencing more than others. The two areas where the Sedimentation has been the highest are the segment downstream of Lock 4 in the Joliet area and the segment upstream of the

Texaco dam. The main factors responsible for the high Sedimentation rates in these two areas are the backwater effects of the Des Piaines River for the lower segment and the Texaco dam for the upper segment In both cases, flow velocities are significantly reduced in those areas as a result of those two main factors.

Outside the two segments discussed above, sediment accumulation in the canal has not been excessive since 1949. One localized area that has accumulated significant sediment is an area just downstream of Lock 2. Most of that sediment is most probably brought into the canal by Fraction Run, which enters the canal 1,500 feet upstream of the lock.

Finally, the change in the canal bottom over the years, reflecting the accumulation of sediment, is indicated in figure 5, which shows the canal bottom profiles from the canal mouth at Joliet to the Texaco plant at Lockport. The three profiles are based on the 1989 survey (solid line), a 1951 report (Illinois Division of Waterways, 1951), and bedrock that can be assumed to be the original bed. As discussed earlier, there is generally sediment accumulation over the whole stretch of the canal; however, the areas with extreme sediment accumulation are located at the upstream and downstream ends of the study area.

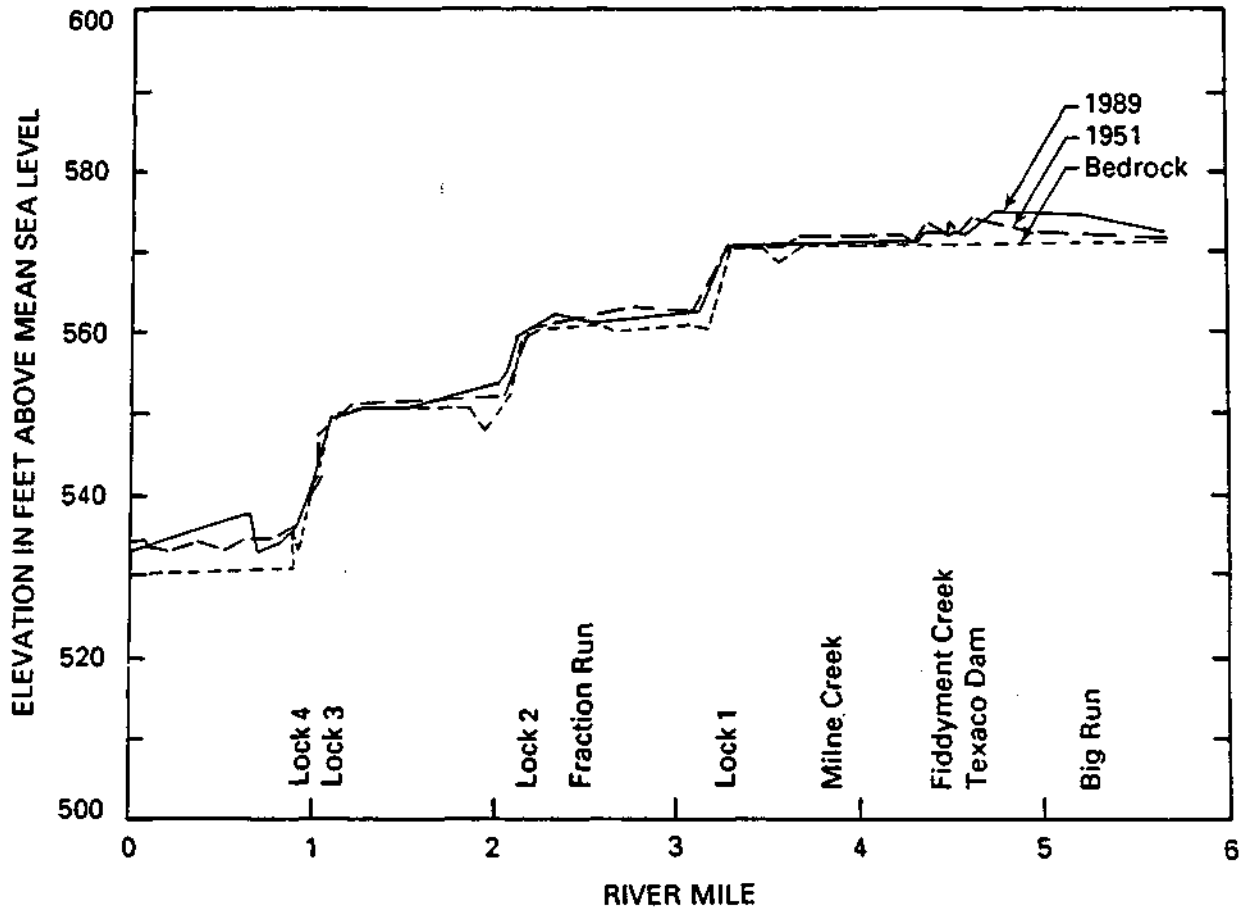


Figure 5. Comparison of bed profiles of the Illinois and Michigan Canal from Joliet to Lockport at different times

REHABILITATION POTENTIALS AND PROBLEMS

One of the main objectives of this study was to evaluate the potential for rehabilitating the I & M Canal in the Lockport area on the basis of the physical condition of the canal and the hydrology and hydraulics of the canal and tributary streams. The major areas of concern were:

- The physical condition of the canal, including sediment accumulation in the canal and the conditions of the levees.
- Water supply and control structures necessary to maintain sufficient depth in the canal.

For the purposes of this study, the canal from Joliet to Lockport was subdivided into four segments. Segment 1 is the segment from the upstream end of the Texaco plant to Lock 1. Segment 2 is from Lock 1 to Lock 2. Segment 3 is from Lock 2 to Lock 3. Segment 4 is from Lock 4 to the junction of the I & M Canal with the Des Piaines River. Lock 4 is located right next to Lock 3. The profile of the canal and the relative locations of the four segments are shown in figure 6. The major factors considered in subdividing the canal within the study area were the condition of the canal within each segment and the possibility of rehabilitation for the different segments. The canal in segment 1 is in fair condition, other than the reach within the Texaco plant. Downstream of the Texaco plant to Lock 1, the canal can be rehabilitated fairly easily if the rehabilitation of Lock 1 that was previously inititated is completed.

The canal in segment 2 (between Locks 1 and 2) is also in fair condition. It will require major Clearing of trees and brush along the levees and possibly some levee repairs. The major need is rehabilitation of Lock 2, which is in very bad condition. Segments 3 and 4 are outside the Lockport area and thus were not seriously investigated in terms of rehabilitation potential. The most significant conclusion based on the survey data and field reconnaissance is that the

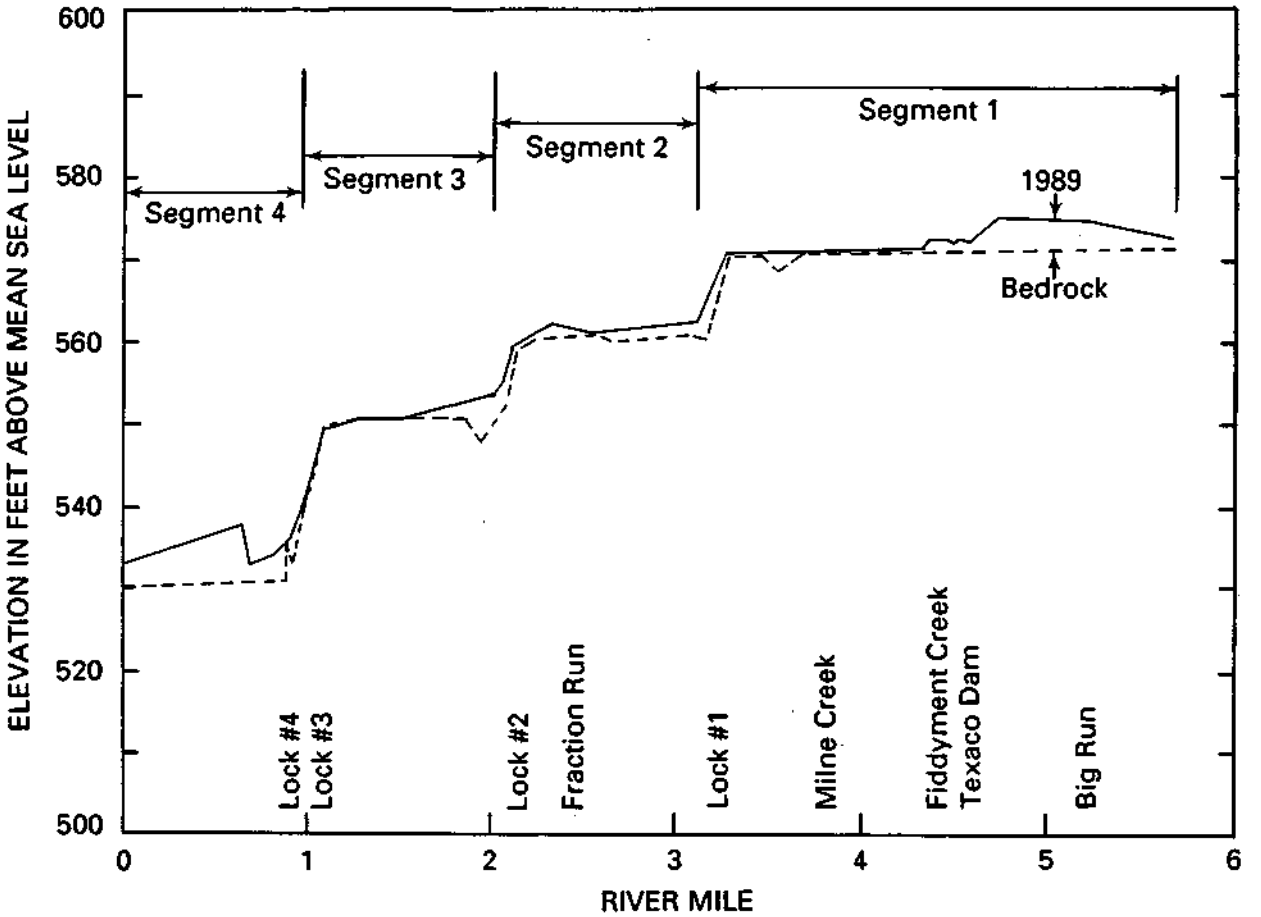


Figure 6. Different segments of the Illinois and Michigan Canal in the study area

rehabilitation of segments 1 and 2 will not be influenced or impacted by the conditions of segments 3 and 4.

Water Supply and Control Structures

The design source of water for this segment of the I & M Canal was initially Lake Michigan and later the Calumet Feeder Canal, which received its water from a reservoir built on the Little Calumet River (Howe, 1956). When the city of Chicago completed the Calumet-Sag Channel in 1920, the Illinois and Michigan Canal south of the Calumet-Sag Channel was isolated, and thus navigation terminated in this segment (Illinois Division of Waterways, 1951). Since that time, the source of water to this segment of the canal has been the tributary streams that drain the area. Even though it is well known that the tributary streams provide excess water far beyond the carrying capacity of the I & M Canal during storm events, it is not known how much sustainable water they provide during periods of low flow.

Most of the tributary streams are very small and do not have any flow in their Channels most of the year. However, Long Run, with a drainage area of 25.5 square miles, might be capable of providing sufficient water to the I & M Canal most of the time. There definitely are times when there is very little or no flow in Long Run; nevertheless, it is the most logical source of water for the I & M Canal. With further hydrologic analysis of the Long Run flow conditions and the impact of the control structures in the Texaco plant, it will be possible to determine the percentage of time when there might be little or no flow in the canal. The Texaco dam might then be used to store water for use in the canal during periods of extreme low flows. Other sources of water include the Chicago Sanitary & Ship Canal, and ground water. In both cases pumpage would be required that might make these options expensive. In any case, these and other issues need further investigation after determination of the possibilities of modifying the control structures within the Texaco plant.

The main water flow control structures within the study area are the four locks from Joliet to Lockport, the Texaco dam, and the side overflow weir upstream of the Texaco dam. The locks have all been out of use and have deteriorated, and thus they no longer control the flow of water in the canal except for their constricted cross sections that might control water surface elevations during flood flows.

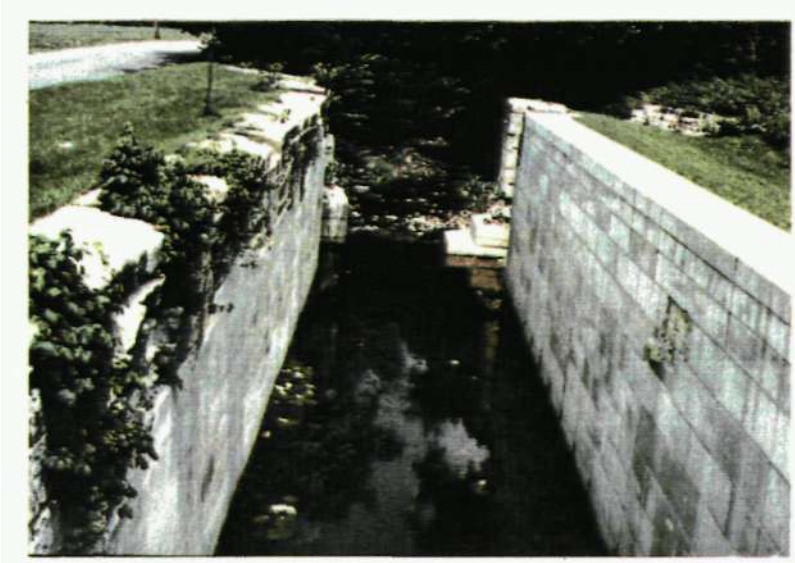
For rehabilitating the I & M Canal in the Lockport area, there is only a need to rehabilitate Locks 1 and 2. Locks 3 and 4 are located farther downstream and are very inaccessible. Their rehabilitation is not a requirement for rehabilitating the canal in the Lockport area.

The rehabilitation of Lock 1 was initiated but has not been completed. The present condition of Lock 1 is shown in figure 7. The condition of the canal immediately upstream and downstream of Lock 1 is also shown in figure 7. The rehabilitation of the lock needs to be completed with the important addition of a water-level-control weir that replaces the gates of the lock.

Lock 2 is located about one mile downstream of Lock 1. The present condition of the lock is shown in figure 8. Trees and brush have overgrown the lock structure. The canal upstream of the lock is in very good condition other than unmaintained, overgrown trees and brush. The canal immediately downstream has accumulated significant amounts of sediment, as shown in figure 8. Major Channel cleaning will be required to fix the canal in that area.

The Texaco dam, shown in figure 9, was built by Texaco to control the flow of water in the canal. It consists of six gates that formerly were controlled separately. It is not known if they are operational or how much it will take to make them operational again. At present, the dam is used to hold back water for use in fire fighting in the Texaco plant.

The overflow side weir, shown in figure 10, is actually a break in the levee with some riprap to control erosion and is not a significant structure. Its purpose is



Looking Upstream
from Lock 1

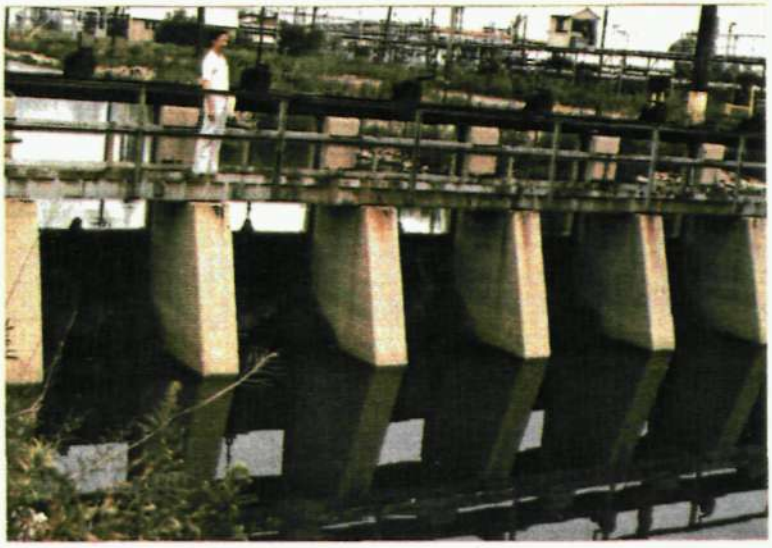
Looking at Lock 1
from Downstream

Looking Downstream
from Lock 1

Figure 7. Pictorial views of Lock 1 and its surroundings

Figure 8. Pictorial views of Lock 2 and its surroundings

Looking Upstream from theTexacoDam



Texaco Dam

Looking Downstream from the Texaco Dam

Figure 9. Pictorial views of the Texaco dam and its surroundings

Looking Upstream from the Overflow Weir

Looking at the Overflow Weir

Looking Downstream from the Overflow Weir

Figure 10. Pictorial views of the overflow weir at the Texaco plant and its surroundings

to allow overflows of floodwater to Deep Run from the I & M Canal. Its installation date is not known. The condition of the canal in the vicinity of the overflow weir is shown by the two pictures in figure 10. The canal is overgrown with Vegetation here and is more of a marsh-wetland environment than **a** navigation canal.

Figures 11 and 12 show how the Texaco dam and the overflow side weir control the flow of water in the canal. The Texaco dam controls the elevation of water upstream of the dam, as shown in figure 11. Depending on the water elevation and the amount of water flowing in from tributary streams and from upstream, water either flows downstream in the canal by overtopping the dam or overflows the side weir and flows into Deep Run. This is illustrated in figure 12. The relative elevations of the dam and side weir determine how much water flows into the canal downstream of the dam. Therefore the future flow of water in the canal will depend on how these two structures are modified and managed.

Canal Bottom and Levees

Because of the lack or in many cases the absence of maintenance along the canal, the condition of the canal and the levees is not very good. The major problems are overgrown trees and brush; accumulations of sediment, trash and junk; and weak levees. Any segment of the canal that is rehabilitated will require Clearing, cleaning, and checking of the levees in terms of their adequacy to hold water.

In the Lockport area, the canal and levees appear to be in fair condition. A certain amount of Clearing and cleaning will be required, but not as much as in other parts of the canal that are in really bad shape. A typical reach of the canal in Lockport at the mouth of Milne Creek is shown in figure 13. Areas such as these will require Clearing, cleaning, and regular maintenance to keep the canal aesthetically pleasing and safe for recreation.

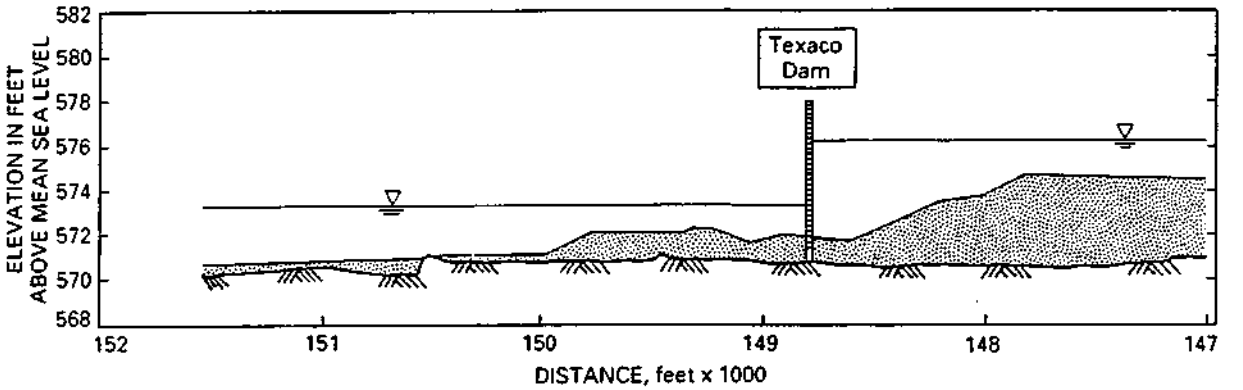


Figure 11. Water-level control at the Texaco dam

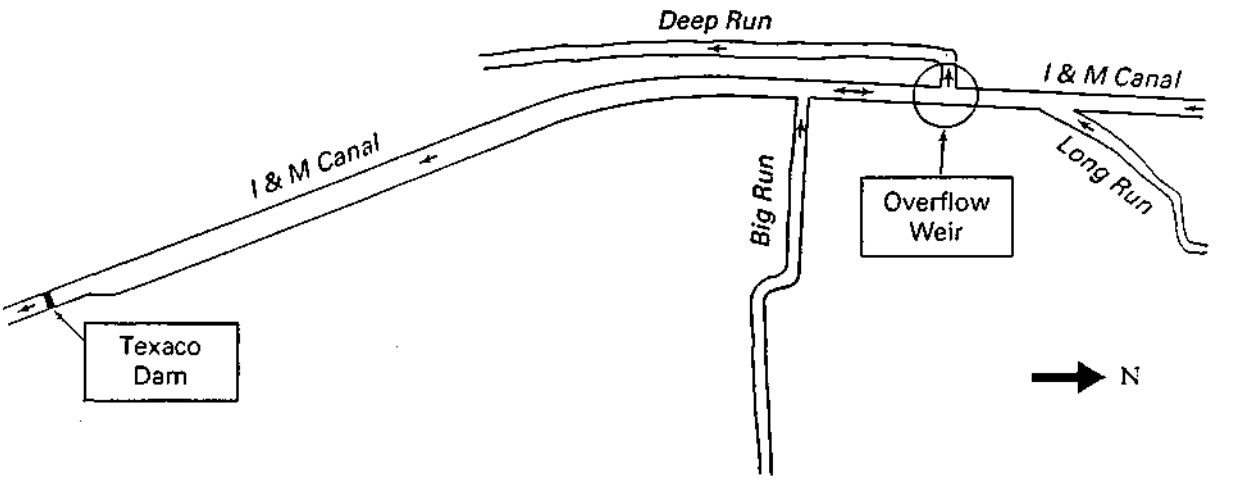


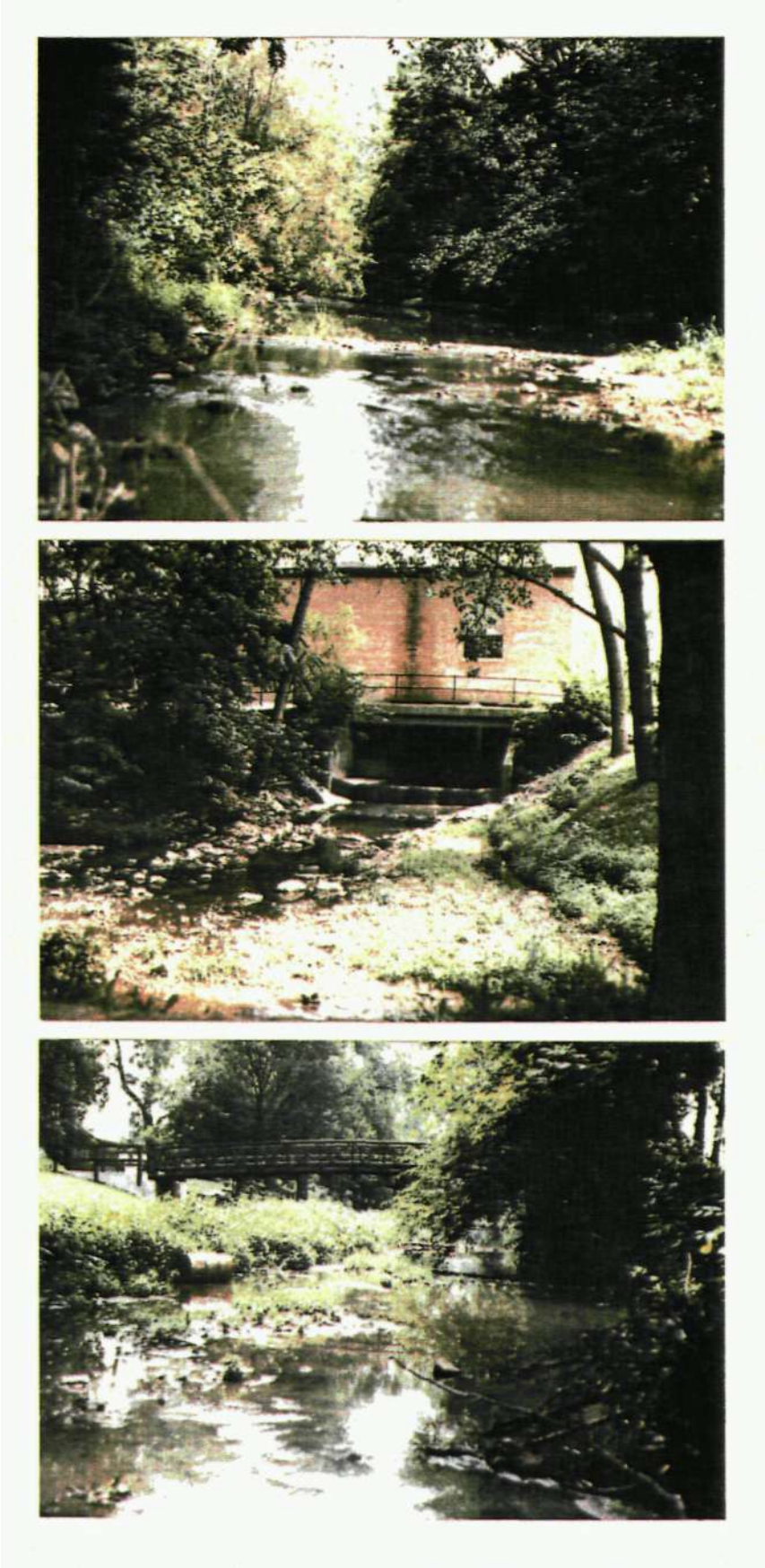
Figure 12. Flow conditions and controls in the Illinois and Michigan Canal within the Texaco plant boundary

Sediment and Water Quality

Problems associated with sediment and water quality are important concerns in terms of long-term rehabilitation of the canal for recreation and other purposes. Existing sediment in the canal and continuing sediment inflow from tributary streams must be dealt with at some time in the future. Sediment accumulation is a major problem in some segments of the canal. In terms of the present study and the major concerns of the present "Lockport Group," sediment accumulation is not a major concern for the segment of the canal that should be rehabilitated first, which stretches from Lock 1 to the Texaco plant. Upstream and downstream of this segment sedimentation problems exist that will require significant clean-up and control efforts. (The "Lockport Group" refers to the group of people from Lockport interested in rehabilitating the I & M Canal in the Lockport area.)

Water quality concerns are related primarily to the source of water and the conditions within the Texaco plant, which are largely unknown. If water is withdrawn from sources such as the Chicago Sanitary & Ship Canal or ground water, those sources must be evaluated as to their suitability and water quality before they are used for the canal. If Long Run and other tributary streams are used as the primary source, then the influence of the Texaco plant on water quality, as water flows past the segment of the canal within the plant, has to be evaluated.

Once discussions are initiated with Texaco and decisions are made on what types of work can be done within the Texaco plant, further evaluations of water quality will be performed depending on the available source of water.



Looking Upstream from
Mouth of Milne Creek

Mouth of
Milne Creek

Looking Downstream from
Mouth of Milne Creek

Figure 13. Pictorial views of the Illinois and Michigan Canal
in the vicinity of the Milne Creek junction

RECOMMENDATIONS

Rehabilitation and maintenance of the I & M Canal are going to require a significant amount of effort and money because of its present condition. Most of the water-control structures in the canal have deteriorated significantly because of lack of maintenance and repair over the years. The canal and its levees are so overgrown with trees, weeds, and brush that a major effort will be needed to clear and maintain the canal.

Because rehabilitation of the I & M Canal will be a major and long-term effort, it is recommended that the effort be pursued in stages. The first stage of the rehabilitation effort should concentrate on the segment of the canal from Lock 1 to the Texaco plant. The rehabilitation of the other segments of the canal, both upstream and downstream of this segment, should wait until the rehabilitation of this segment is completed. The main reasons for choosing this segment are: 1) it is the most visible segment in the Lockport area, 2) the rehabilitation of Lock 1 was initiated but has not been completed, and 3) it is in better condition than any other segments of the canal in the area.

The rehabilitation of this segment of the canal, from Lock 1 to the Texaco plant, will require implementation of the following three main tasks:

1. Rehabilitating Lock 1 and installing a weir with variable height.
2. Clearing and cleaning the canal within this segment.
3. Making arrangements with Texaco to modify the two control structures within the Texaco plant so that adequate water is available in the I & M Canal.

Brief discussions of the three main tasks are presented below.

1. Rehabilitating Lock 1 and installing a weir with variable height at the lock.

The rehabilitation of Lock 1 was initiated as part of the restoration effort of the canal. However, it is not known when the project will be completed. For the

present project, the rehabilitation of the lock needs to be completed by the addition of a weir structure at the downstream end of the lock. The weir is required to maintain a desirable depth of water in the canal under variable flow conditions.

The weir should be either movable or tiltable so that its height can be controlled for different flow conditions. During flood periods, the weir could be designed either to be removed or to be tilted to the bottom of the Channel, so that its impact on flooding would be controlled. During periods of low flow, the height of the weir would be set at a desirable level.

If the weir is not movable or tiltable, so that it can be either raised above the water surface or tilted to the canal bottom during flood events, it will definitely increase flood elevations upstream of Lock 1 for some flow conditions. Determination of how much the installation of the weir will increase flood elevations for different flow conditions will require a detailed hydrologic and hydraulic investigation.

Three 48-inch culverts on the west levee of the canal upstream of Lock 1 are used to divert some of the flood flows in the I & M Canal into Deep Run. Unfortunately, the bottom elevations of these culverts were not included in the Illinois and Michigan Canal survey (Baird & Co., 1989). However, field reconnaissance indicated that the culverts are several feet above the canal bottom and will not be impacted by the proposed 3-foot pool in the canal during low and medium flows in the canal. However, since flood elevations are expected to increase during flood conditions with a non-movable or non-tiltable weir at Lock 1, it is reasonable to expect the frequency of overflow from the canal into Deep Run through the culverts to increase. With a movable or tiltable weir that can be either raised above the water surface or tilted to the canal bottom during flood events, however, the function of the culverts will not be impacted.

The canal within this reach (Lock 1 to the Texaco plant) can be managed to hold up to 6 feet of water with 2 feet freeboard without major modifications. However, it is not necessary at present to maintain this depth. Initially the canal should be designed to hold 3 feet of water by setting the height of the weir at the lock to 574 feet above mean sea level (msl). The weir should be designed such that the height could be either increased or decreased in the future without much structural modification to the lock or weir.

The relative elevations of water in the canal with respect to the canal bottom and the top of the levees are shown in figure 14 for the proposed weir elevation of 574 feet msl. As shown in the figure, the water elevation will be well below the top of the levees. This is further illustrated in figure 15, where the proposed water surface elevations are indicated for selected cross sections between Lock 1 and the Texaco dam. However, it should be mentioned that even though the elevation of the levees is well above the proposed water elevation, some segments of the levees might require repair after the Clearing of brush and trees that have overgrown along the canal.

2. Clearing and cleaning the canal.

As discussed earlier, the canal has accumulated sediment in certain segments and is overgrown with weeds and brush. Tree experts from IDOC and city officials from Lockport should inspect the canal from Lock 1 to the access road outside of the Texaco plant and should remove all the brush and cut the undesirable trees and weeds from within the canal and on the levees. Further field investigation of the levees will be required to ascertain their suitability to hold water 3 feet deep. The survey data and preliminary field inspections indicate that this segment of the canal should not require major levee rehabilitation.

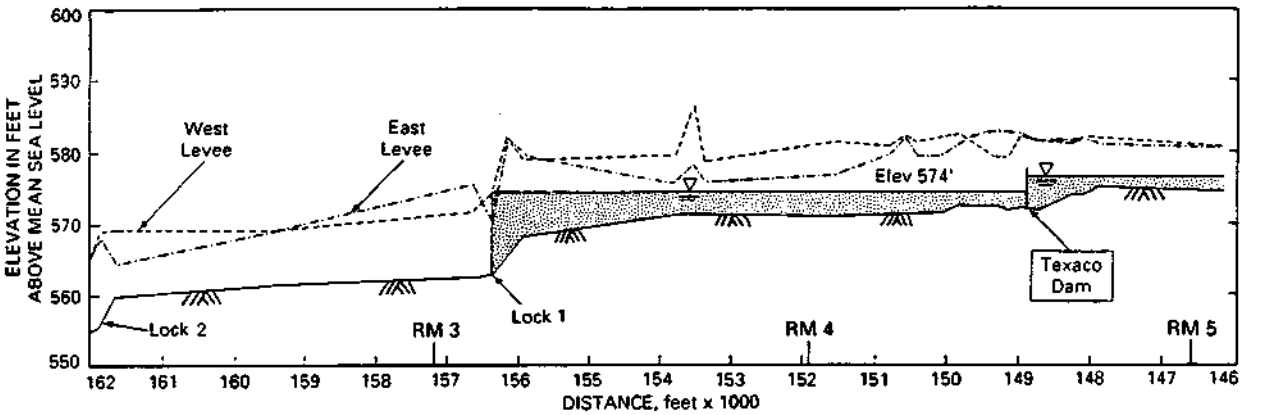


Figure 14. Proposed water elevations from Lock 1 to the Texaco dam

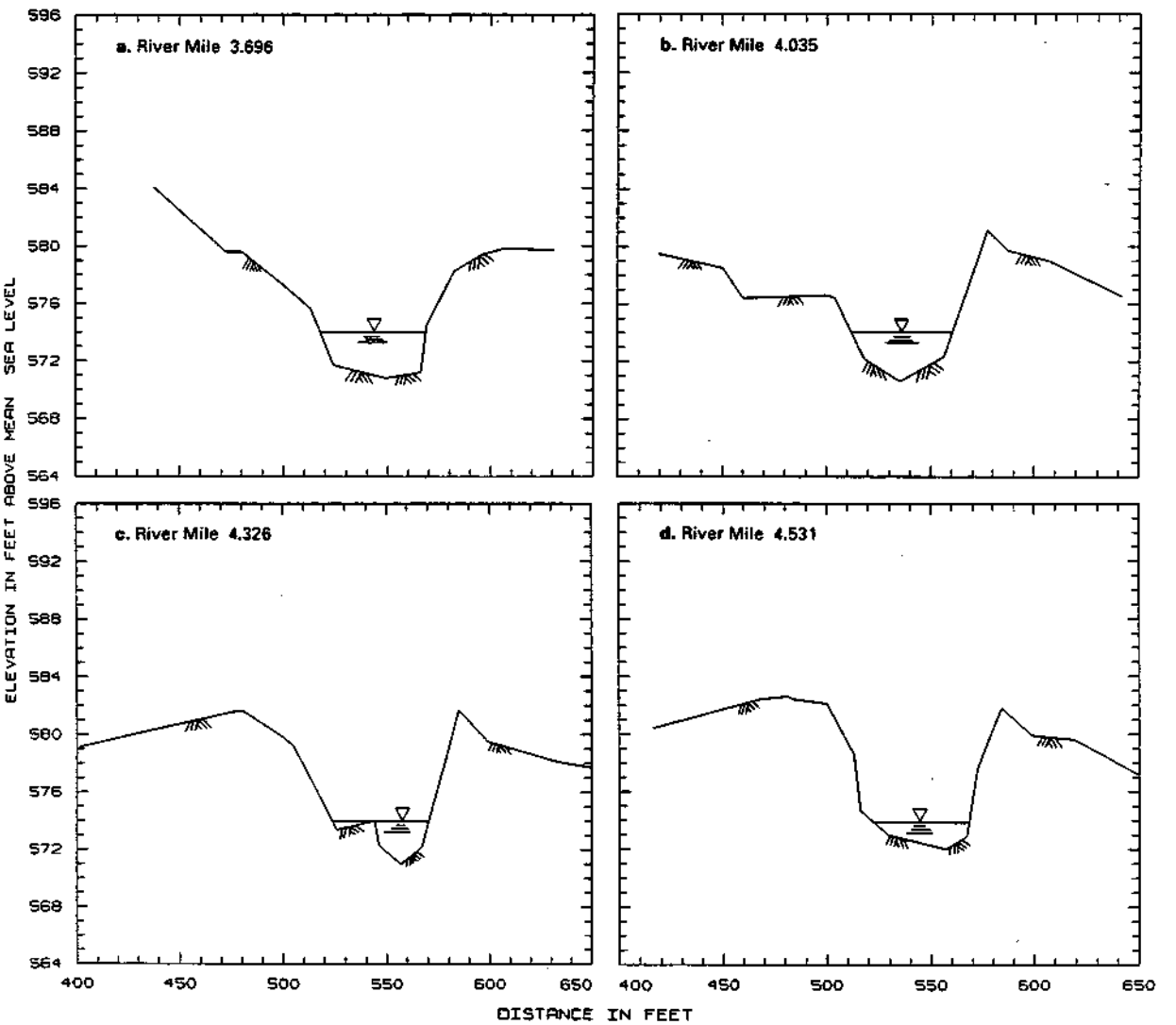


Figure 15. Proposed water elevations at selected cross sections between Lock 1 and the Texaco dam

3. Making arrangement with Texaco to modify the two control structures within the Texaco plant so that adequate water is available in the I&M Canal.

The amount of water flowing in the canal downstream of the Texaco plant during non-flood periods is largely controlled by the two structures within the Texaco plant. The tributary streams that enter the canal downstream of the control structures and upstream of Lock 1 (Fiddyment Creek and Milne Creek) do not contribute significant flow to the canal during most of the year when there is no runoff from storms or snowmelt. Therefore they cannot be relied upon to supply water to the canal throughout the year. The most reliable supply of water available to the canal is from Long Run, which enters the canal within the Texaco plant boundary.

As discussed previously, the two structures within the Texaco plant boundary control the flow of water downstream into the canal. The first one is the Texaco dam, with control gates that have not been operated for a long time. The second one is a side weir on the west levee of the canal that allows the overflow of water into Deep Run. Modifications and control of these two structures are needed to control the amount of water in the canal. Since both these structures are located within the Texaco plant, arrangements have to be made with Texaco to carry out the modifications.

If such arrangements cannot be made, other reliable sources of water need to be investigated. Since the tributary streams entering the canal downstream of the control structures cannot be rehed upon to maintain adequate water depth in the canal, other sources of water that need to be looked into include ground water and the Chicago Sanitary & Ship Canal.

Since modification of the canal control structures within the Texaco plant is 'the best alternative, it is not necessary to investigate these other sources of water before exploring the possibilities with Texaco. Therefore, it is recommended that the

IDOC and the "Lockport Group" for rehabilitating the canal formally initiate discussion with Texaco concerning the control structures within the Texaco plant.

A major concern about the supply of water from the Texaco plant area to the I & M Canal downstream is the quality of water. Concerns have been expressed that the sediment within the Texaco plant area might be polluted and thus might be a source of pollution in the canal. This concern should be discussed and further analysis of the water quality made depending on the arrangements with Texaco.

Finally, if a favorable arrangement is reached with Texaco, a detailed hydraulic analysis needs to be conducted to determine the elevation of the overflow side weir and the modification and control mechanisms for the Texaco dam.

Once the rehabilitation of this segment of the canal is either completed or near completion, the second phase of the canal rehabilitation in the Lockport area can be initiated. The second phase will involve rehabilitating Lock 2 and the segment of the canal between Lock 2 and Lock 1. The rehabilitation of Lock 2 will be similar to that of Lock 1, including the addition of a water-level-control weir at the downstream end. Since the problems of water supply would have been resolved in phase 1 and experience gained in rehabüitation of Lock 1 and the first segment, phase II should be easier and cheaper than phase I.

OUTLINE FOR DETAILED HYDROLOGIC AND HYDRAULIC STUDY

As discussed in the introduction, this report is the result of a preliminary feasibility study to evaluate the potential for rehabilitating the I & M Canal. The study was funded by a $10,000 grant from the Illinois Department of Conservation (IDOC). This report has accomplished the objective of the project and identified definite projects that could be implemented without further studies and some Problems that need additional and detailed investigations.

One of the seven tasks identified in the proposal for this project was the preparation of an outline for a detailed hydrologic and hydraulic study that will be required for further evaluation of feasible Solutions. A draft report prepared for IDOC's review did not include the proposed outline for further hydrologic and hydraulic study. As expected, the review of the draft report generated the following comments and questions:

What are the hydraulic effects on the study area at different flood frequencies (say, 10, 25, 50, l00 years) based on normal pool elevations?

Will the canal towpath levee be overtopped during the flood conditions?

What will be the structural integrity of the towpath levee during flood conditions?

How much flow will be needed to maintain the proposed pool elevation?

Although sections 3 and 4 were not addressed, what impacts will result downstream of Lock 2 during flood conditions?

How will sediment transport into the canal be controlled in problem areas? Will a control device be needed or will a more traditional method, such as periodic maintenance dredging, be adequate?

Most of these comments and questions deal with flooding and the impacts of any new project on flooding. When discussions were conducted to scope the initial

feasibility study, it was decided that it was not necessary and not appropriate to conduct a detailed hydrologic and hydraulic study before any feasible projects are identified. It was agreed to proceed in stages: the initial stage would identify whether there are any feasible projects, after which detailed studies could be conducted if needed. The results of this study and the comments and concerns it generated show a definite need for a more detailed hydrologic and hydraulic study. The main objective and tasks of the detailed study will be as follows.

Objective

The main objective of the project will be to conduct a detailed hydrologic and hydraulic study to investigate the impacts of flooding on the I & M Canal and the impacts of any of the projects recommehded in the initial study on flooding along the I & M Canal.

Tasks

To accomplish the above objective, the project will require the completion of the following tasks.

Task 1. Determine flood hydrographs for various frequency storms (5-, 10-, 25-, 100-year) for all tributary streams entering the I & M Canal upstream of Lock 2 and downstream of the Cal-Sag Channel. This task will require application of the HEC-1 flood hydrograph Computer program to generate the flood hydrographs for each sub-watershed for given storm events.

Task 2. Route the flood flows through the tributary Channels and the I & M Canal to determine flood elevations along the canal. This will require application of the HEC-2 flood routing Computer program.

Task 3. On the basis of the results of task 2, determine areas that are flooded during different frequency storms under existing conditions.

Task 4. Evaluate the flooding impacts of the proposed weir at Lock 1.

Task 5. Evaluate the impact of modifying the overflow weir into Deep Run on flooding along the I & M Canal.

Task 6. On the basis of available data and field inspections, assess the stability of the canal levees for different flow conditions.

Task 7. Estimate future Sedimentation rates within the canal and evaluate Potential maintenance dredging requirements or sediment control measures.

Task 8. Prepare a draft report based on the study, submit it to IDOC for review and comments, and then prepare a final report incorporating the comments from the agency.

Duration and Cost

The project will require 18 months for completion from the date of project funding. Based on the tasks outlined above, the study is estimated to cost $45,000.

REFERENCES

Baird & Company. 1989. Illinois and Michigan Canal Survey. Lockport, Illinois.

Demissie, M., and B. Stephanatos. 1986. Investigation of Flooding along the Illinois and Michigan Canal in Grundy County, Illinois. Illinois State Water Survey Contract Report 402.

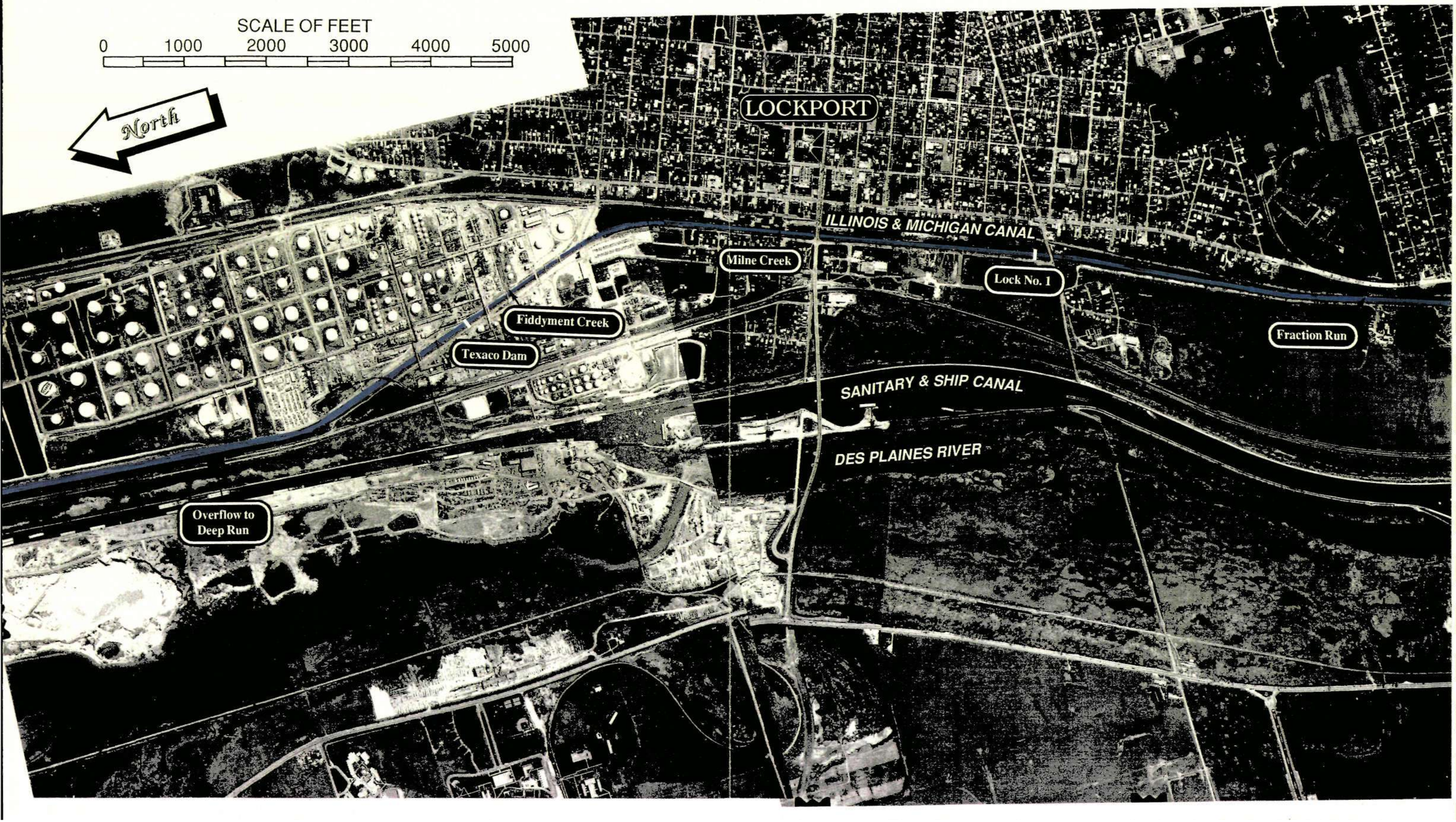
Howe, W.A. 1956. Documentary History of the Illinois and Michigan Canal; Legislation, Litigation and Titles. Division of Waterways, Department of Public Works and Buildings, State of Illinois.

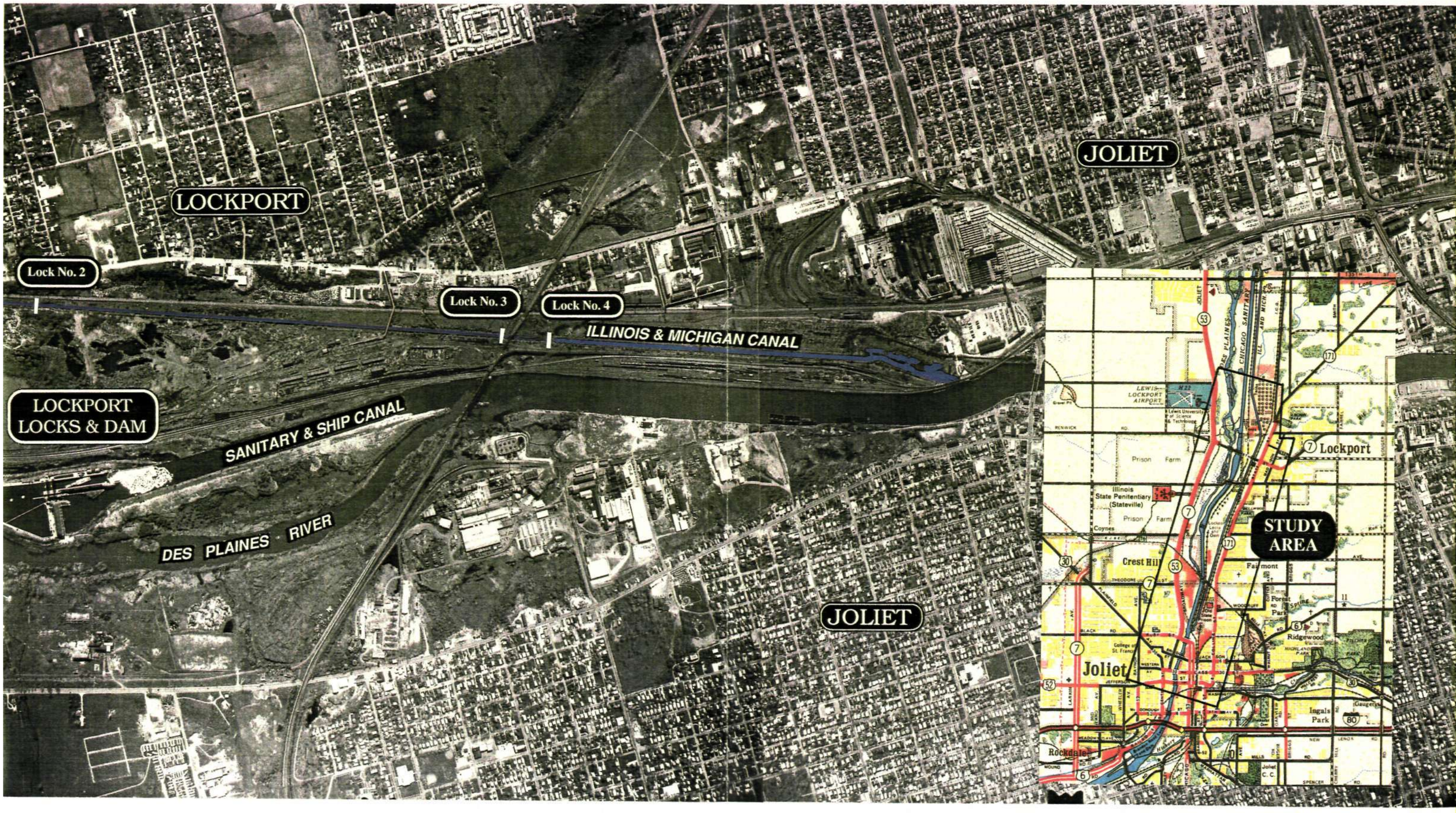
Illinois Department of Conservation. 1948. The Illinois and Michigan Canal. State of Illinois.

Illinois Division of Waterways. 1950. Cross Sections: Illinois and Michigan Canal. Department of Public Works and Buildings, State of Illinois.

Illinois Division of Waterways. 1951. Survey Report for Flood Control: Illinois and Michigan Canal and Tributaries; Joliet to Calumet-Sag Channel. Department of Public Works and Buildings, State of Illinois.

Aerial Photo Foldouts:
Illinois and Michigan Canal from Joliet to the Texaco Refinery


SCALE OF FEET
0
1000
2000
3000
4000
5000
North
LOCKPORT
ILLINOIS & MICHIGAN CANAL
Milne Creek
Lock No. 1
Fiddyment Creek
Texaco Dam
Fraction Run
SANITARY & SHIP CANAL
DES PLAINES RIVER
Overflow to
Deep Run


LOCKPORT
JOLIET
Lock No. 2
Lock No. 3
Lock No. 4
ILLINOIS & MICHIGAN CANAL
LOCKPORT
LOCKS & DAM
SANITARY & SHIP CANAL
DES PLAINES RIVER
JOLIET
STUDY
AREA
Lockport
Crest Hill
Joliet
Ridgewood
Rockdale
Ingals
Park
Fairmont
Illinois
State Penitentiary
(Stateville)
Prison
Farm
Coynes
Forest
Park
Joliet
C. C.
CHICAGO SANITARY
ILL. AND MICH.
DES PLAINES

Appendix A. Comparison of Cross-Sectional Profiles from the 1989 and 1949 Surveys at Different Locations

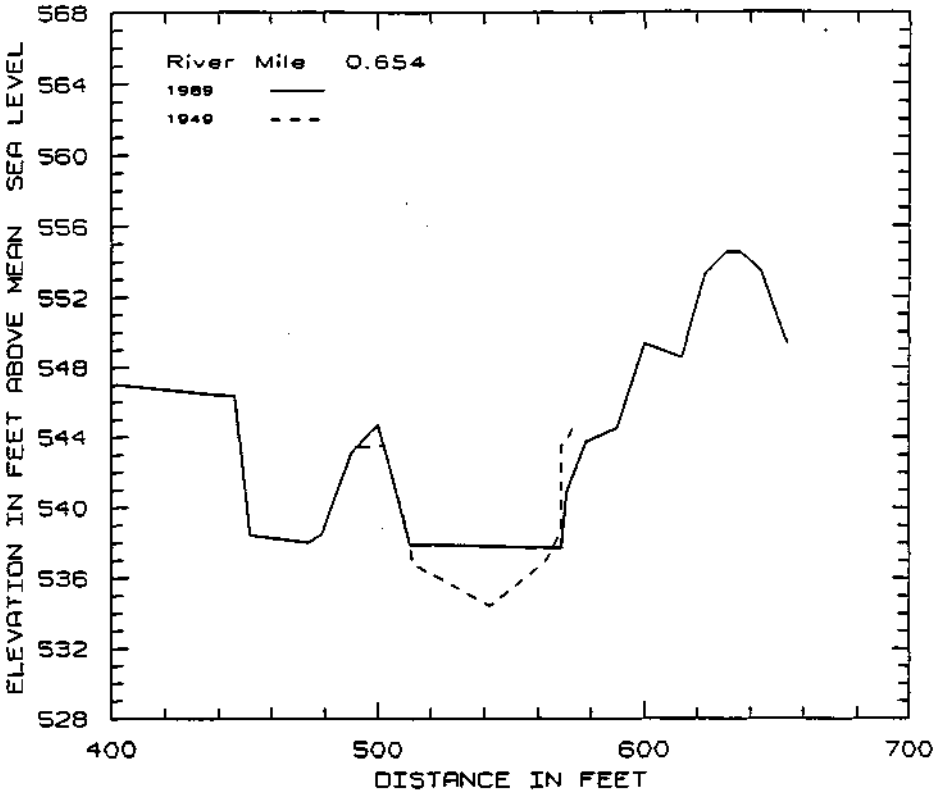


Figure A-1. Comparlson of 1949 and 1989 cross-sectional profiles at River Mile 0.654

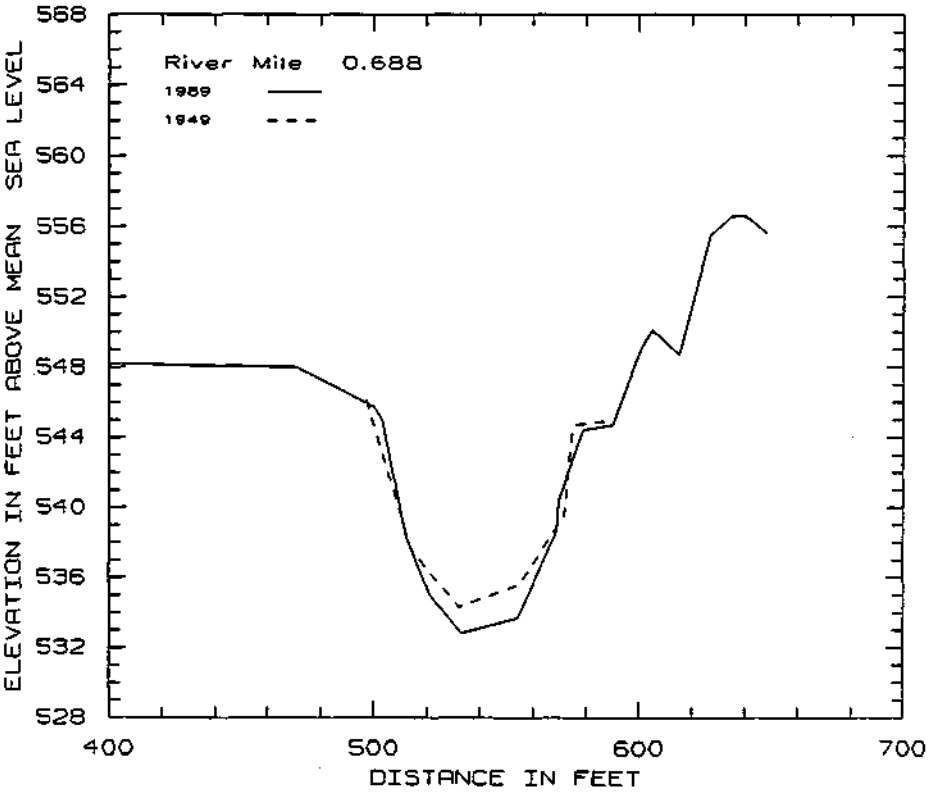


Figure A-2. Comparlson of 1949 and 1989 cross-sectional profllles at River Mile 0.688

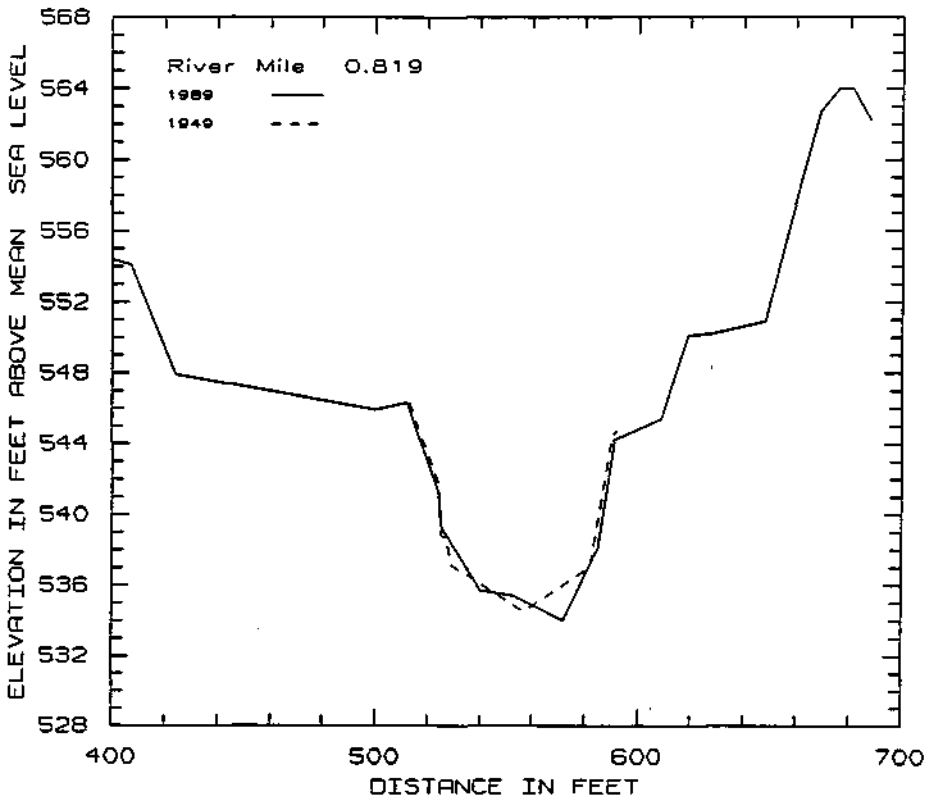


Figure A-3. Comparison of 1949 and 1989 cross-sectional profiles at River Mile 0.819

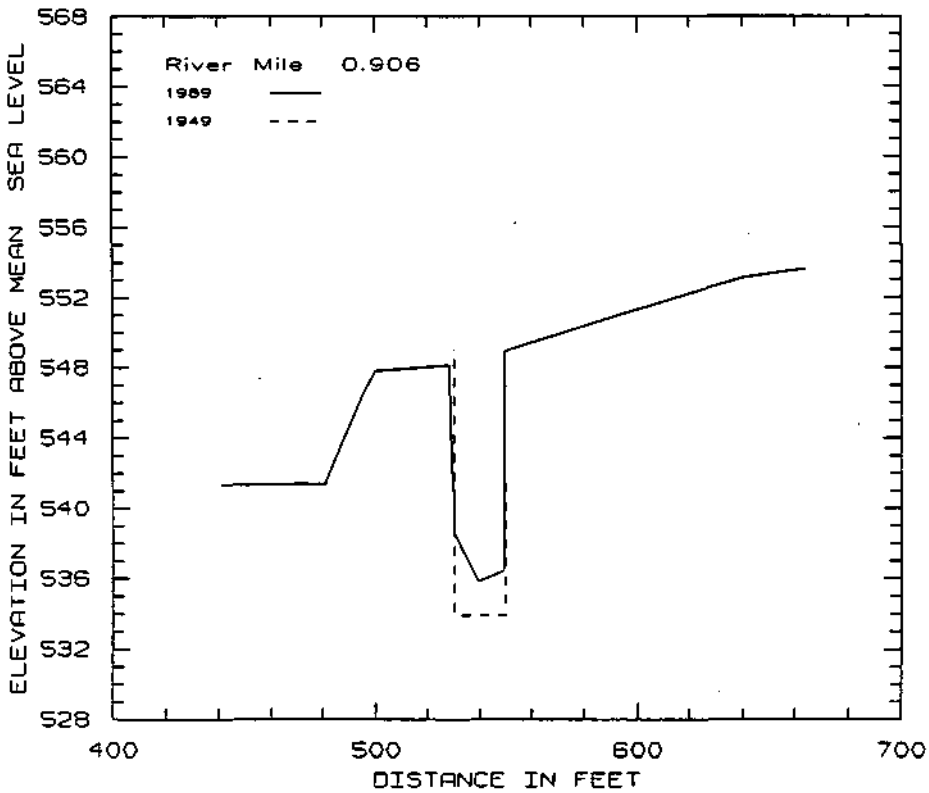


Figure A-4. Comparison of 1949 and 1989 cross-sectional profiles at River Mile 0.906

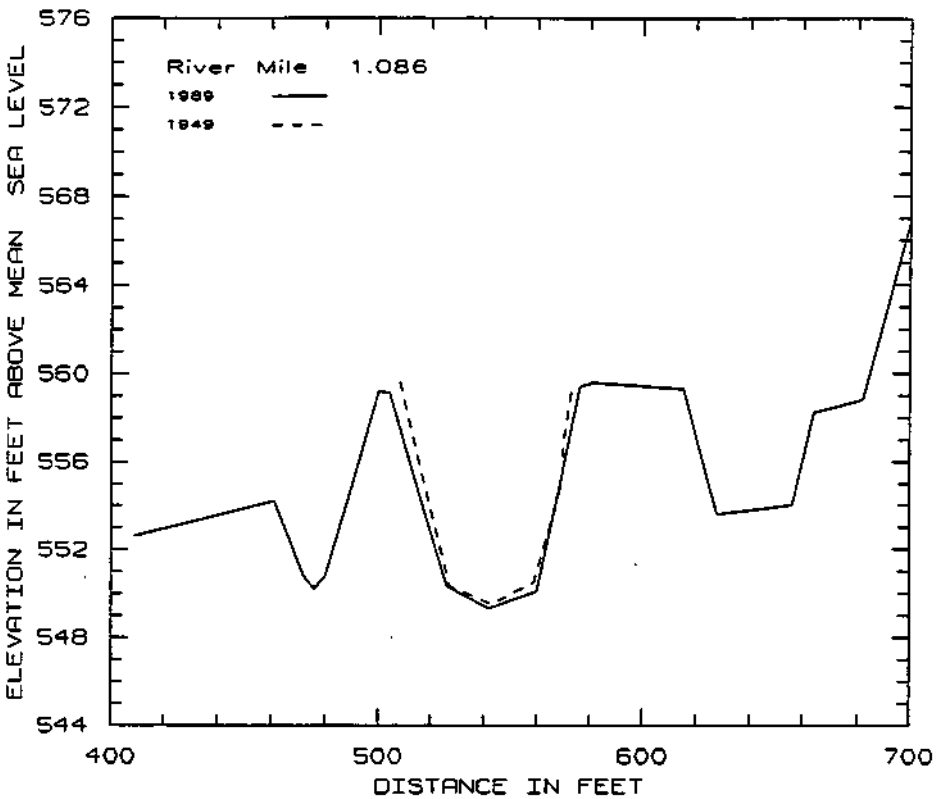


Figure A-5. Comparlson of 1949 and 1989 cross-sectional profiles at River Mile 1.086

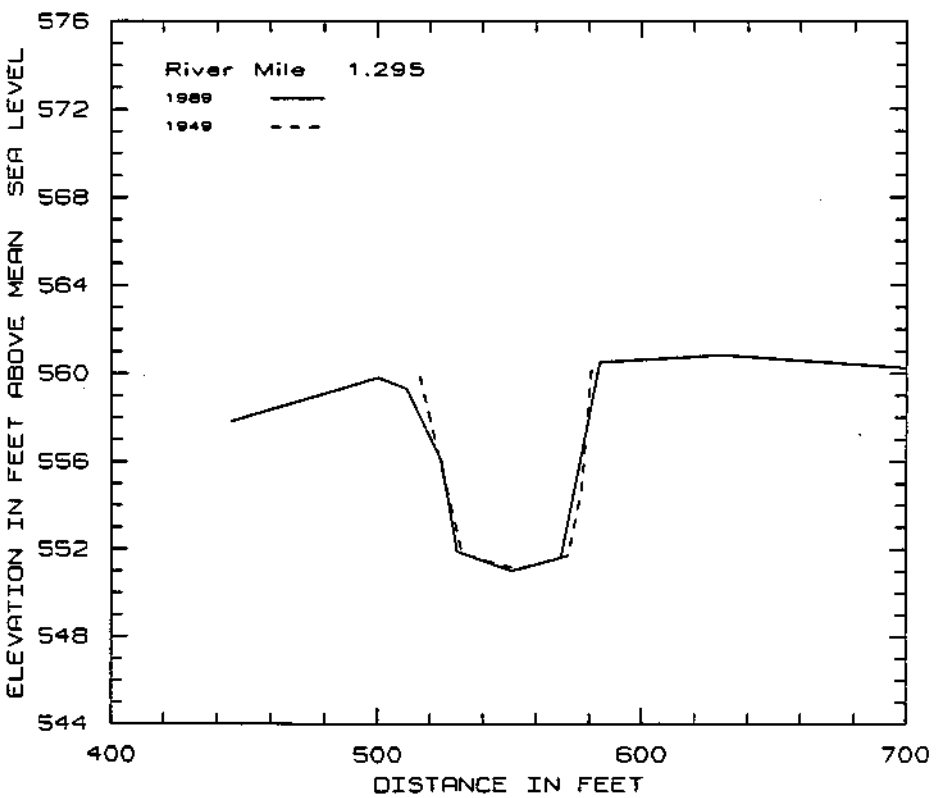


Figure A-6. Comparlson of 1949 and 1989 cross-sectional profiles at River Mile 1.295

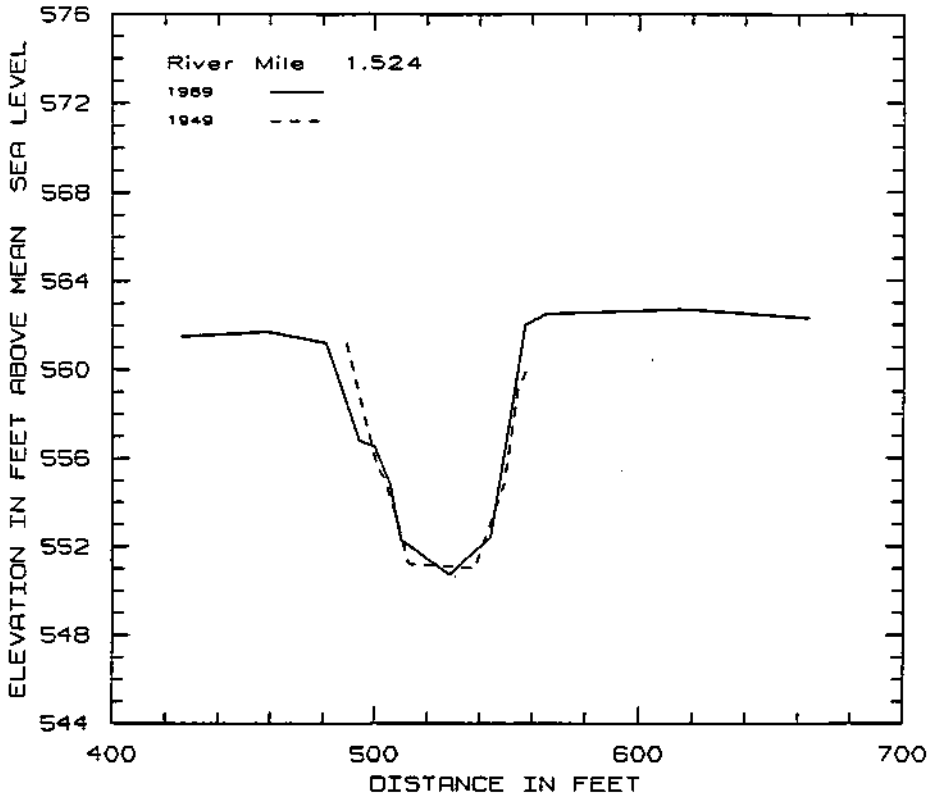


Figure A-7. Comparison of 1949 and 1989 cross-sectional profiles at River Mile 1.524

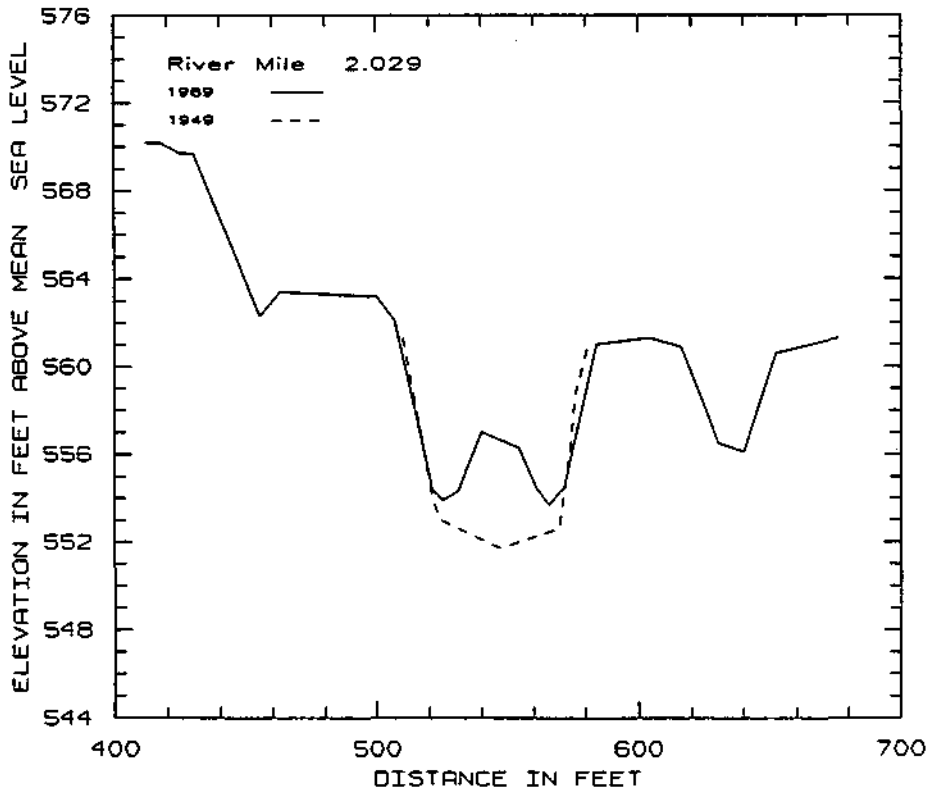


Figure A-8. Comparison of 1949 and 1989 cross-sectional profiles at River Mile 2.029

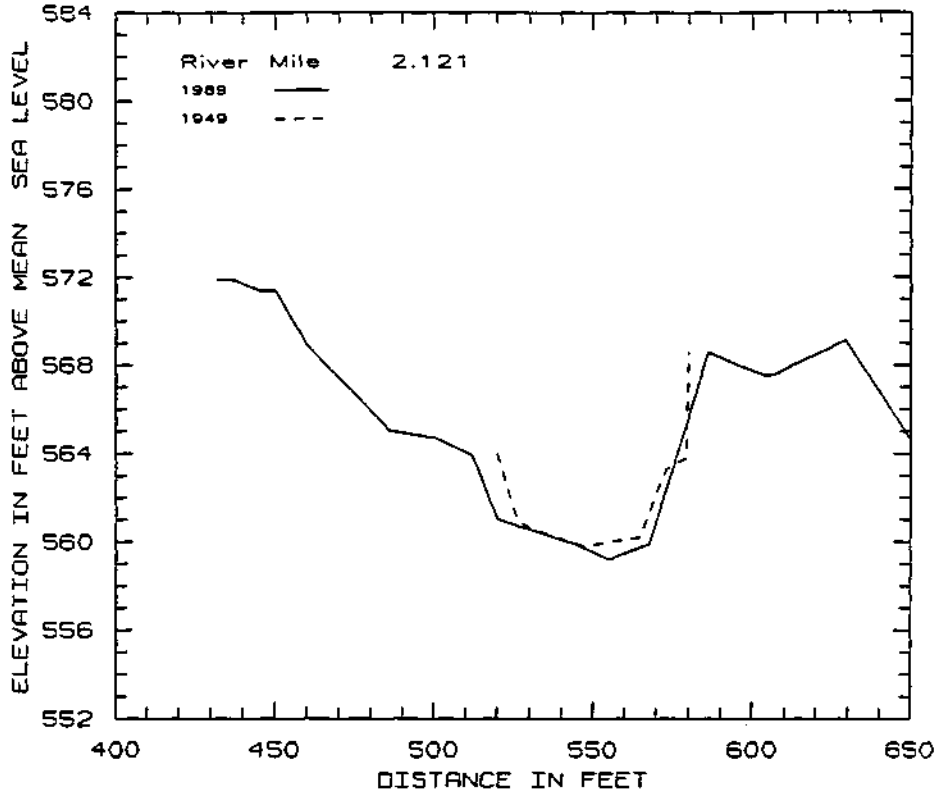


Figure A-9. Comparison of 1949 and 1989 cross-sectional profiles at River Mile 2.121

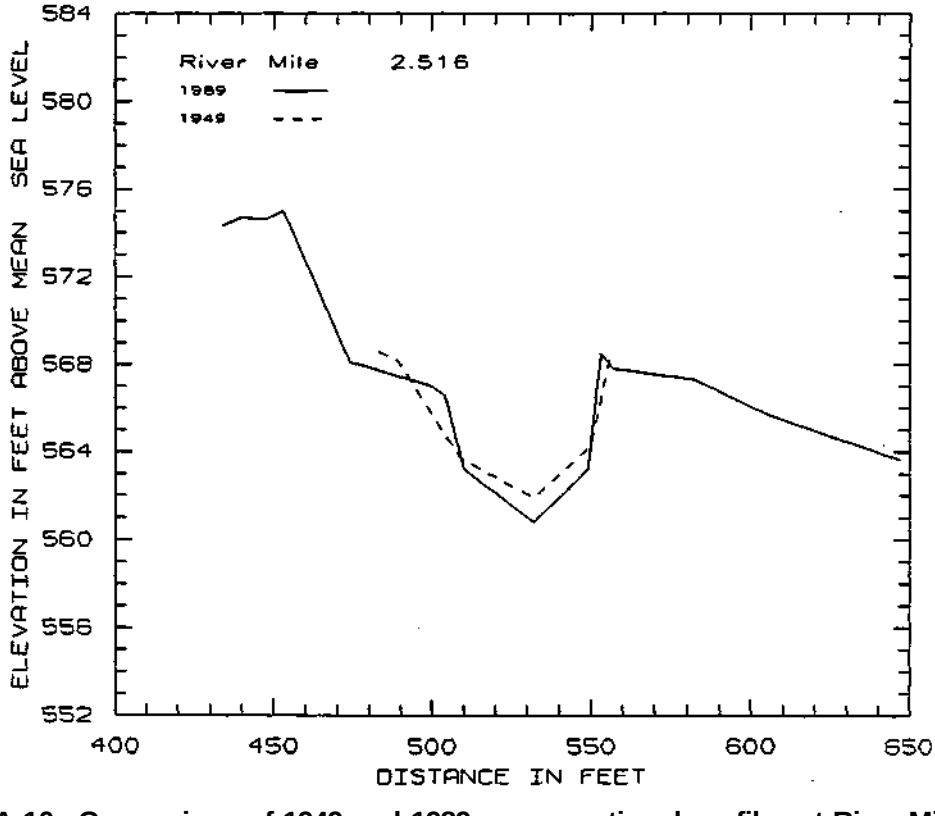


Figure A-10. Comparison of 1949 and 1989 cross-sectional profiles at River Mile 2.516

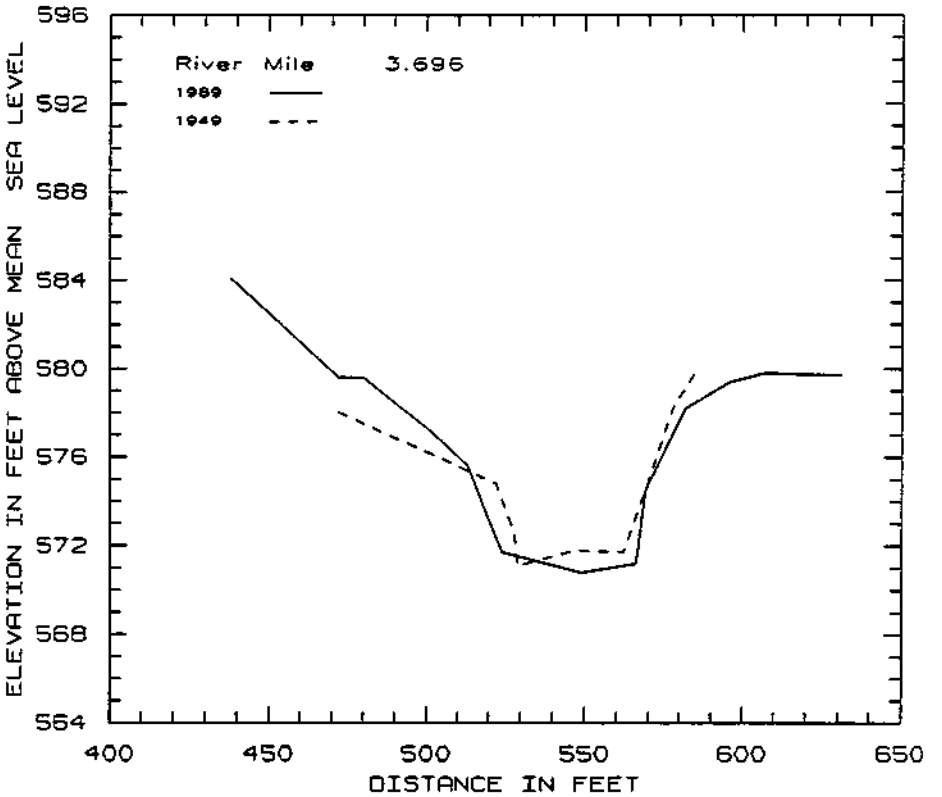


Figure A-11. Comparlson of 1949 and 1989 cross-sectional profiles at River Mile 3.696

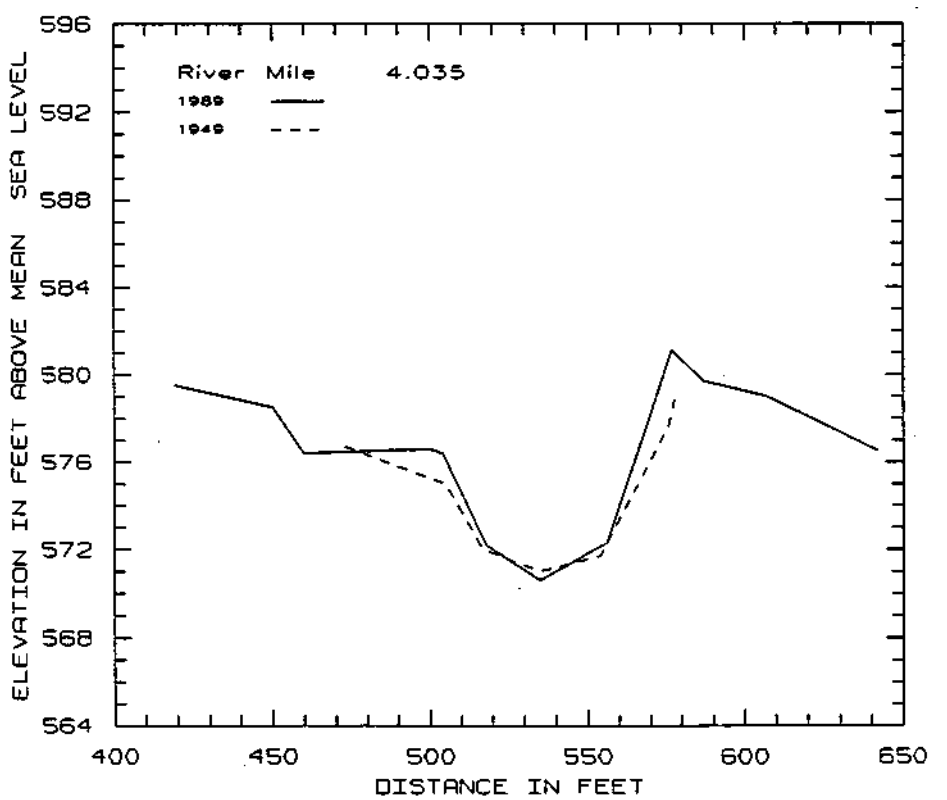


Figure A-12. Comparlson of 1949 and 1989 cross-sectional profiles at River Mlle 4.035

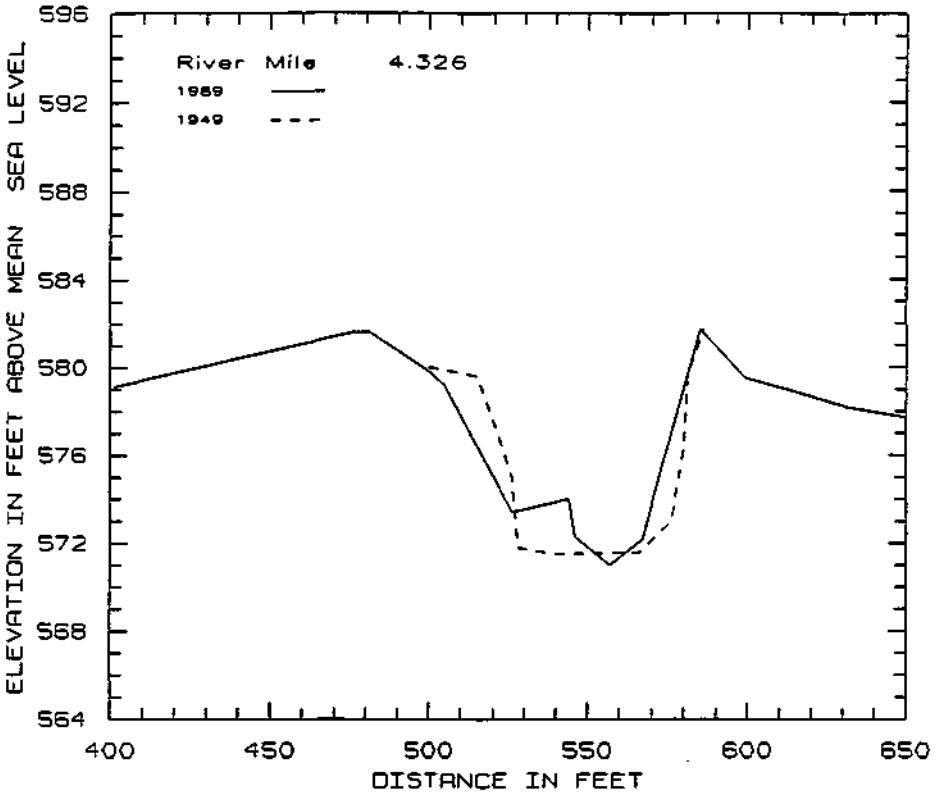


Figure A-13. Comparison of **1949 and** 1989 cross-sectional profiles at River Mile 4.326

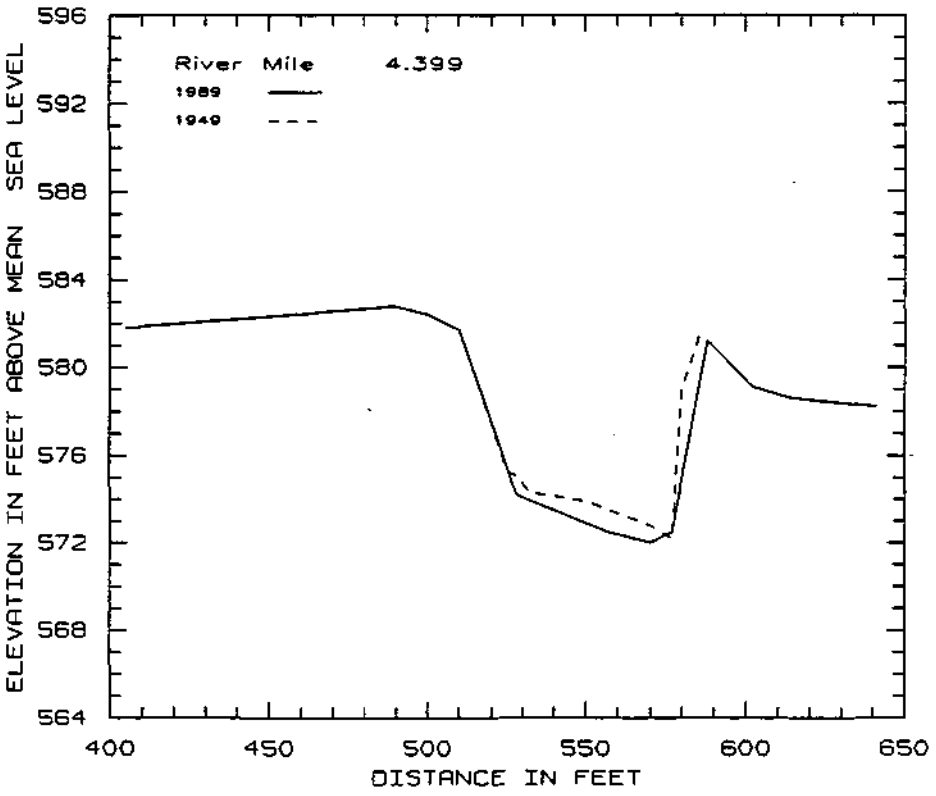


Figure A-14. Comparison of 1949 and 1989 cross-sectional profiles at River Mile 4.399

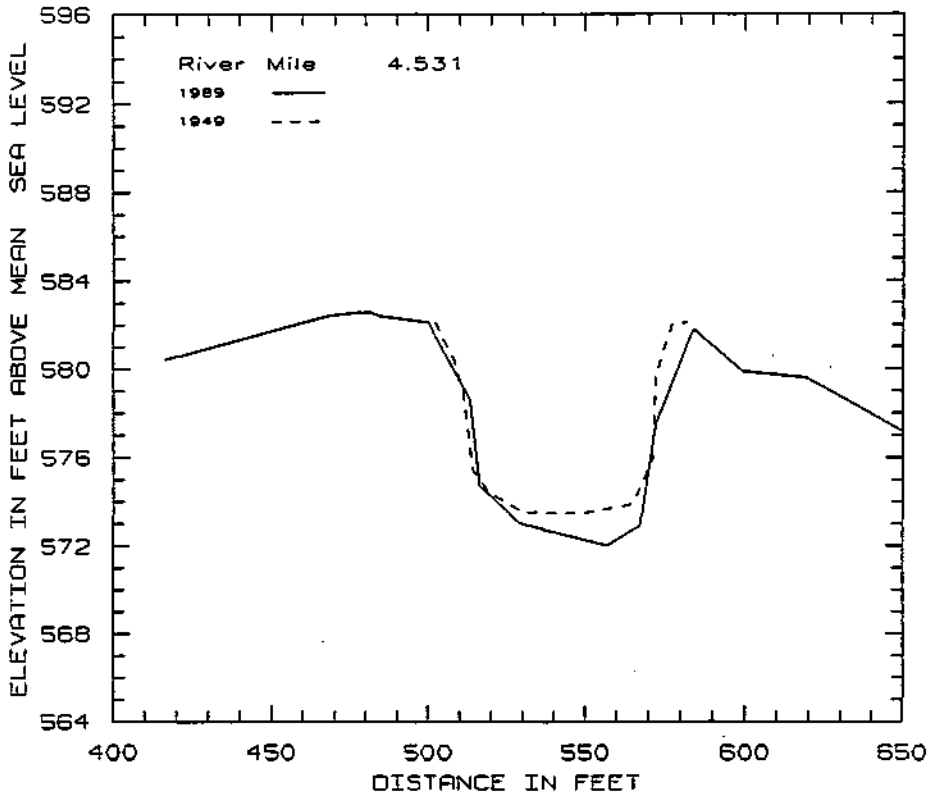


Figure A-15. Comparlson of 1949 and 1989 cross-sectional profiles at River Mite 4.531

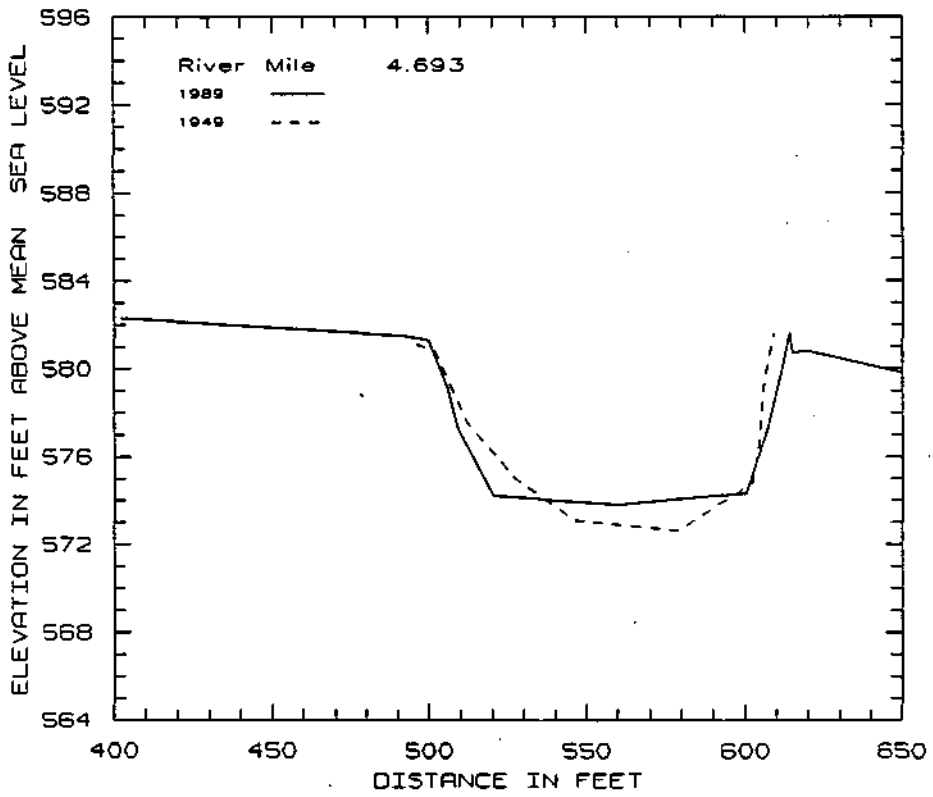


Figure **A-16. Comparlson of 1949 and 1989 cross-sectional profiles at River Mile 4.693**

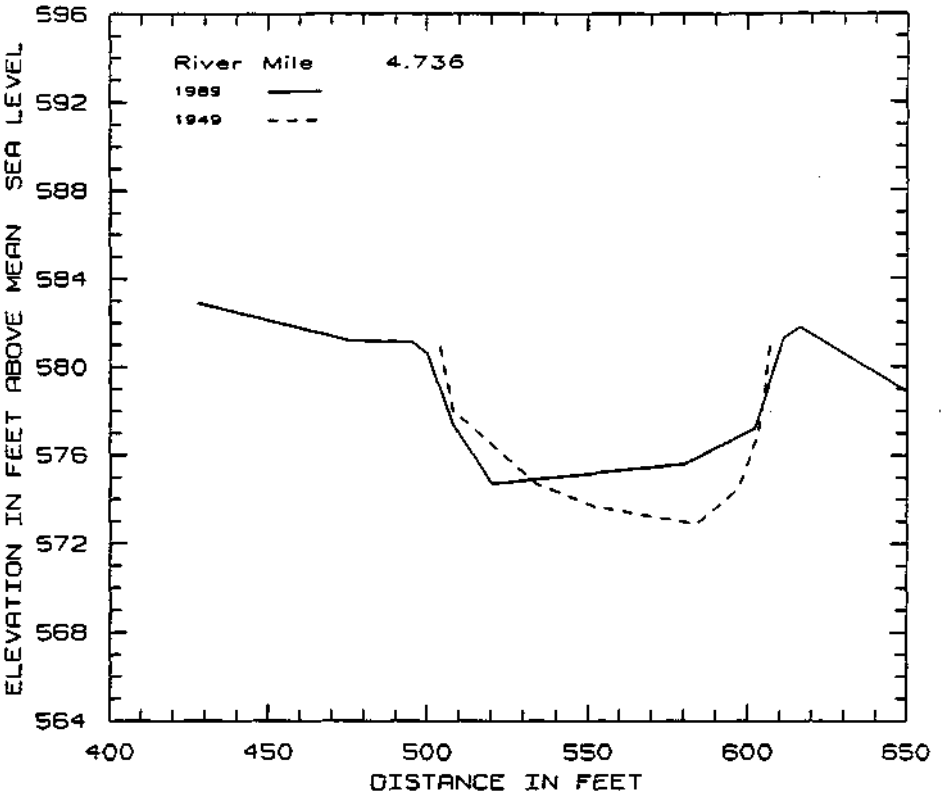


Figure A-17. Comparison of 1949 and 1989 cross-sectional profiles at River Mile 4.736

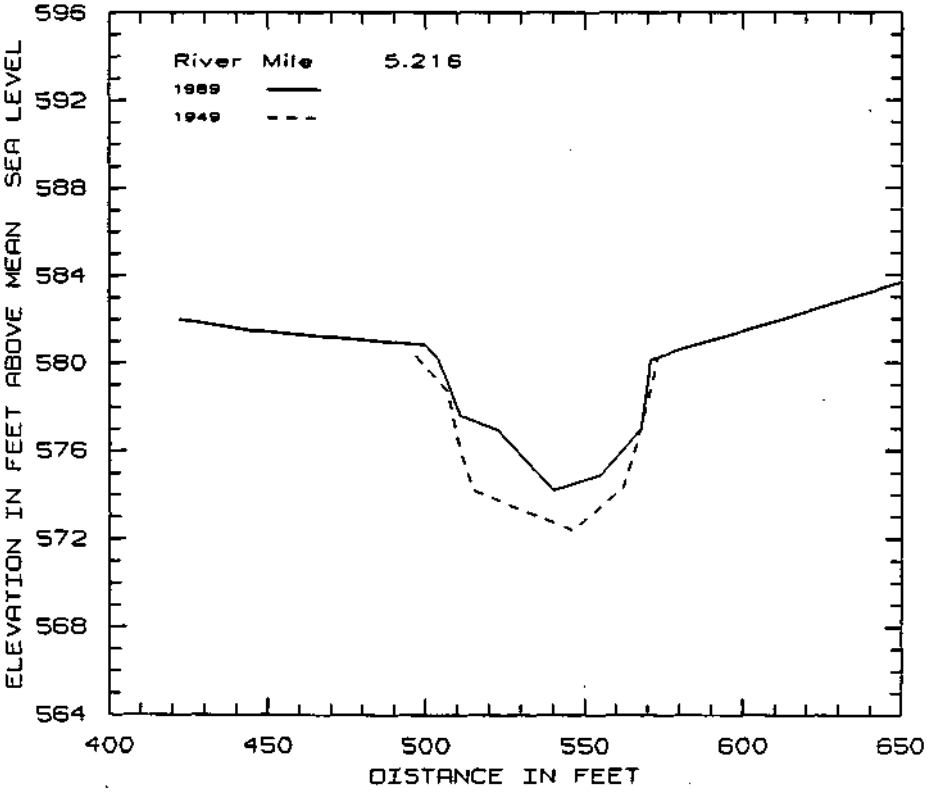
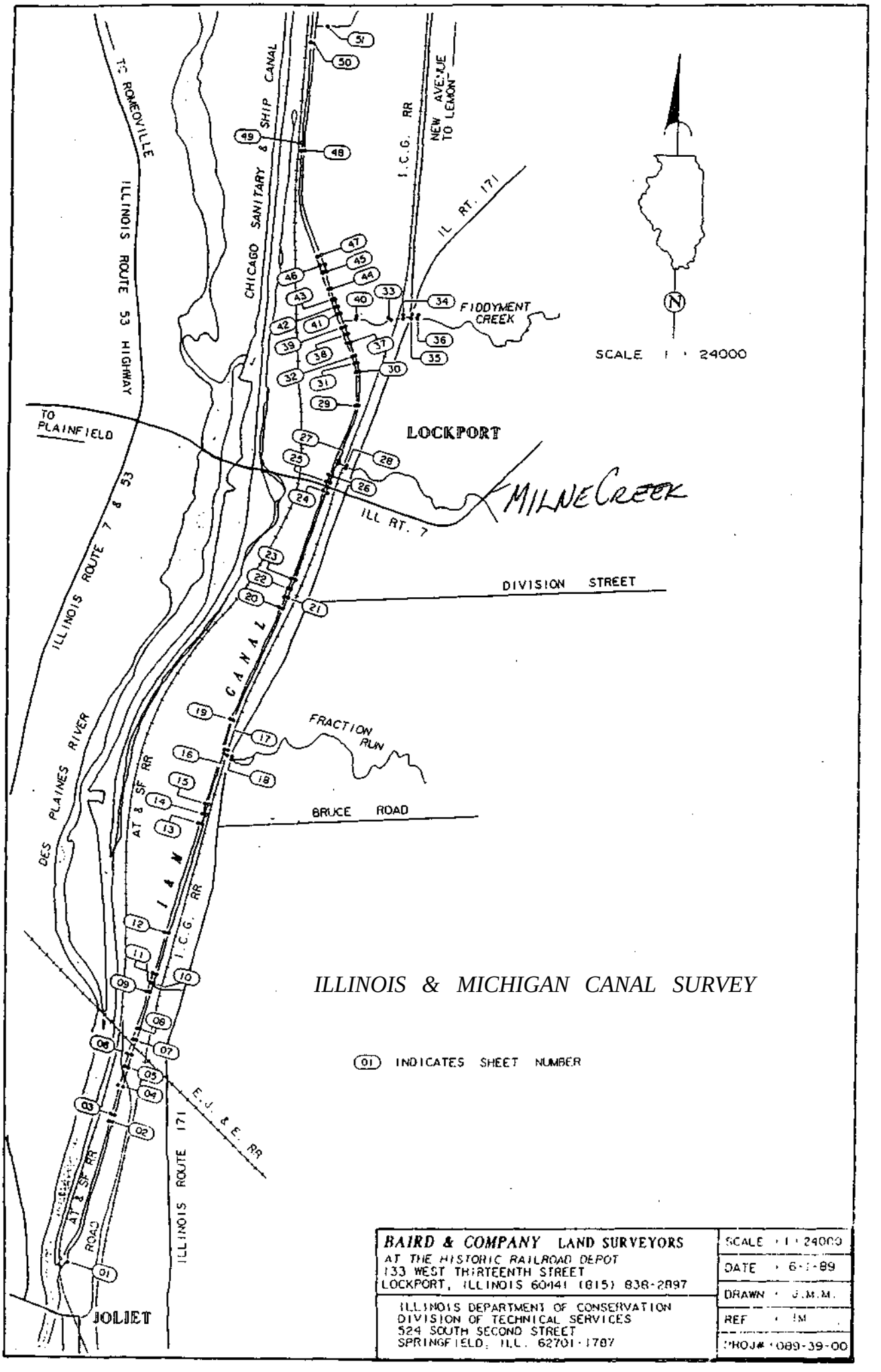


Figure A-18. Comparison of 1949 and 1989 cross-sectional profiles at River Mile 5.216

Appendix B. Illinois and Michigan Canal Survey Results, 1989

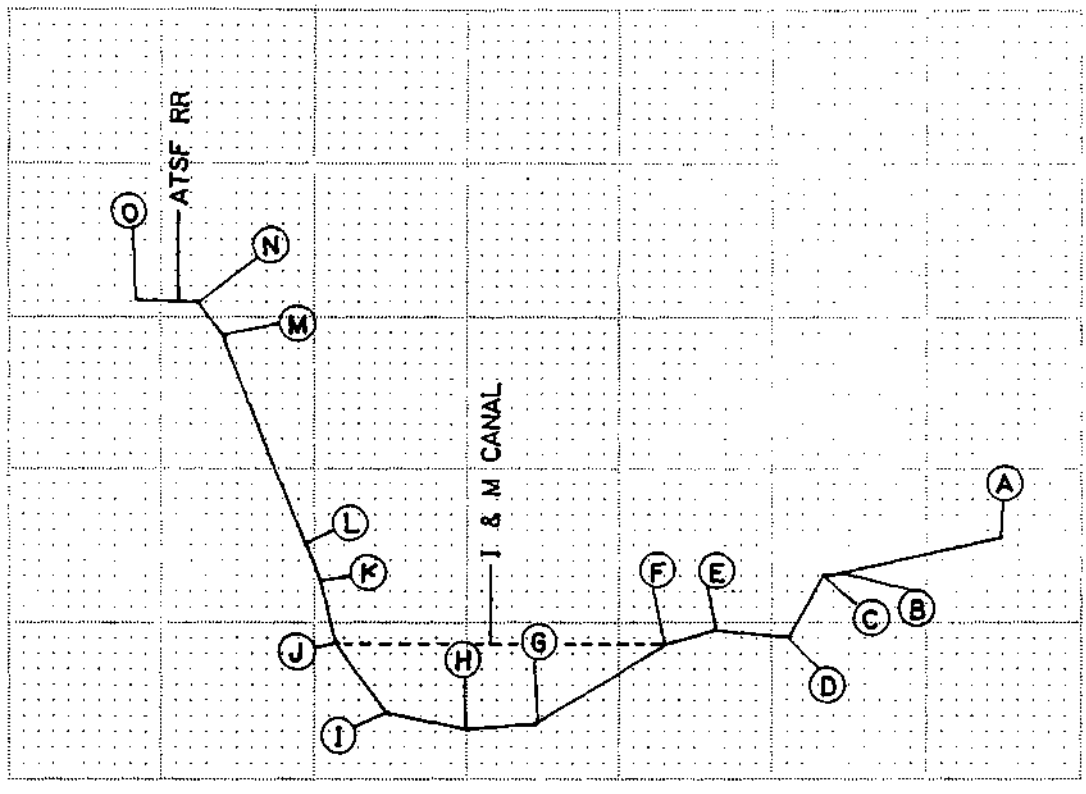


BAIRD & COMPANY LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441 (815) 838-2897

ILLINOIS DEPARTMENT OF CONSERVATION
DIVISION OF TECHNICAL SERVICES
524 SOUTH SECOND STREET
SPRINGFIELD, ILL. 62701-1787

SCALE	1" = 24000
DATE	6-1-89
DRAWN	J.M.M.
REF	IM
PROJ#	089-39-00

SECTION 1A



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+31	545.5			
B	4+94	543.2			
C	5+00	543.0	1774865.910	568995.345	
D	5+13	539.1			
E	5+43	539.5			
F	5+63	538.5			
G	6+13	533.5			
H	6+41	533.1			
I	6+73	534.2			
J	6+92	538.7			
K	6+94	542.7			
L	7+05	545.0	1774954.760	568810.920	SEE TIE SHEET 01 T
M	7+35	558.8			
N	7+46	561.0			
O	7+70	561.3			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

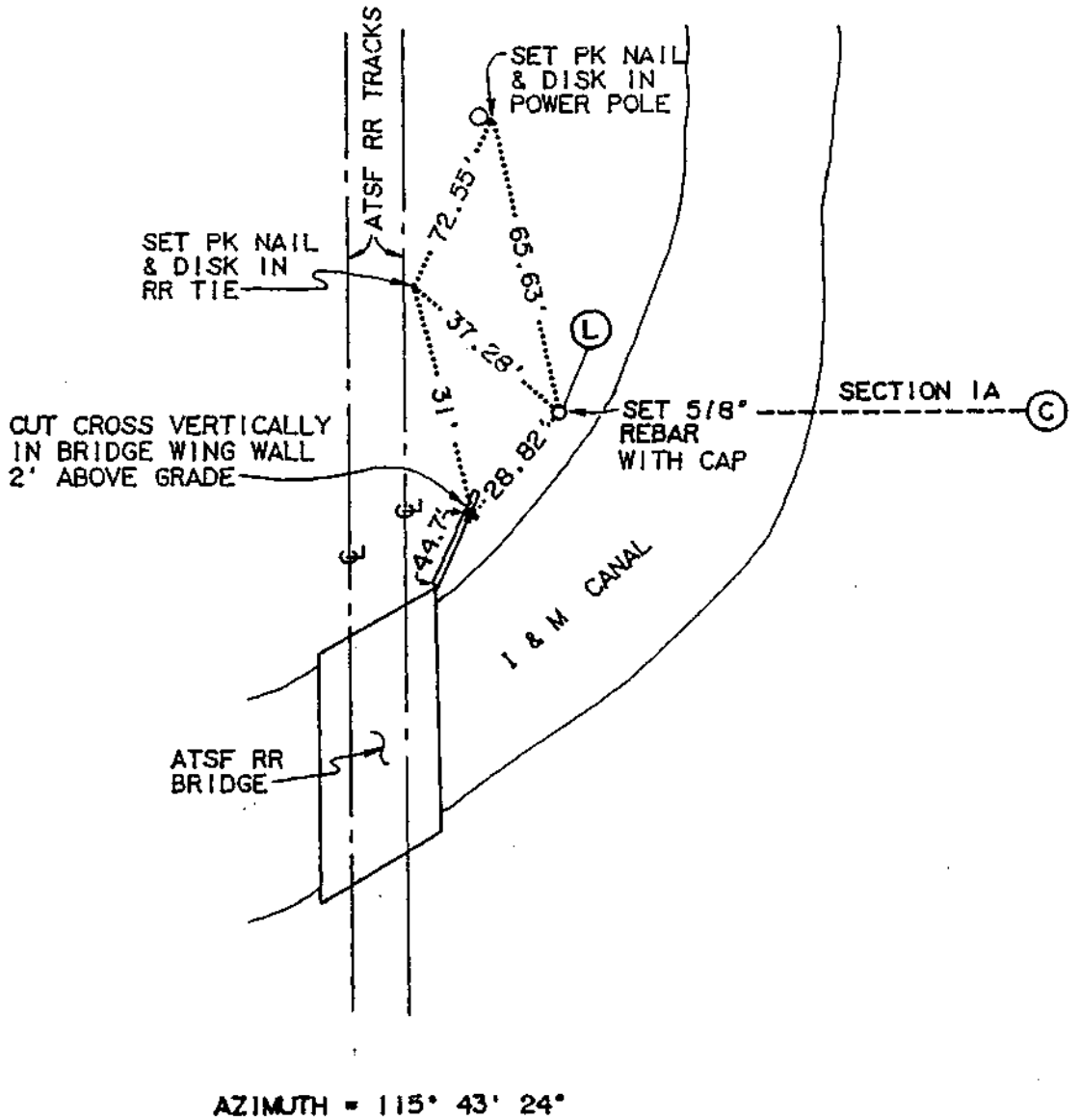
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P30

DATE 4-21-89

NO. 089-39-01

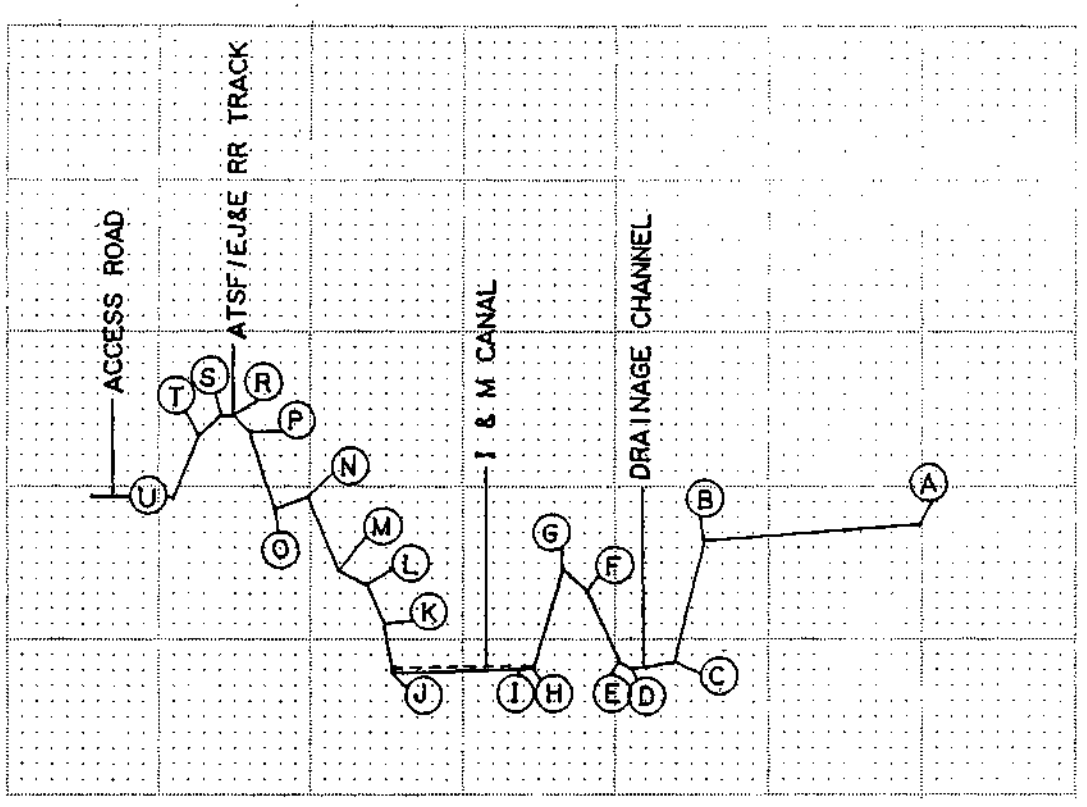
TIE DIAGRAM
SECTION IA (WEST)



BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P50
DATE 3-13-89
NO. 089-39-01 T

SECTION 2A



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	3+61	547.6			
B	4+46	546.3			
C	4+52	538.4			
D	4+74	538.0			
E	4+79	538.5			
F	4+90	543.1			
G	5+00	544.7	1778159.240	570077.665	
H	5+12	537.9			
I	5+14	537.9			
J	5+69	537.7			
K	5+71	540.9			
L	5+78	543.7			
M	5+90	544.5			
N	6+00	549.3	1778188.620	569981.583	SEE TIE SHEET 02 T
O	6+14	548.5			
P	6+23	553.3			
R	6+31	554.5			
S	6+36	554.5			
T	6+44	553.4			
U	6+54	549.3			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

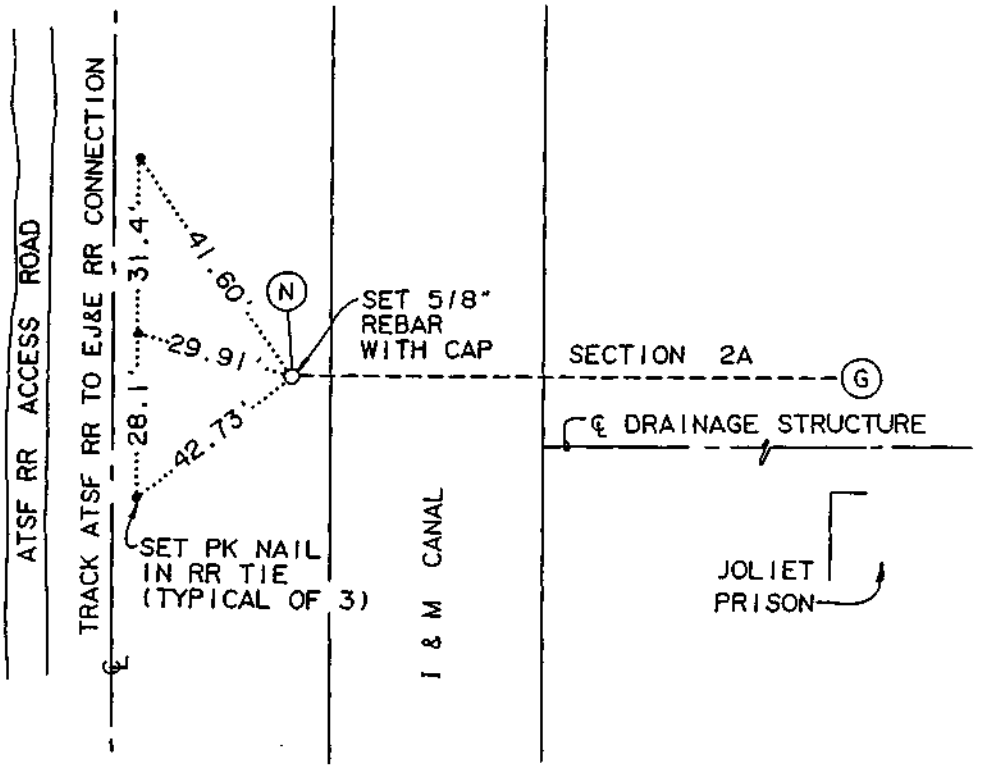
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P32

DATE 4-24-89

NO. 089-39-02

TIE DIAGRAM
SECTION 2A (WEST)

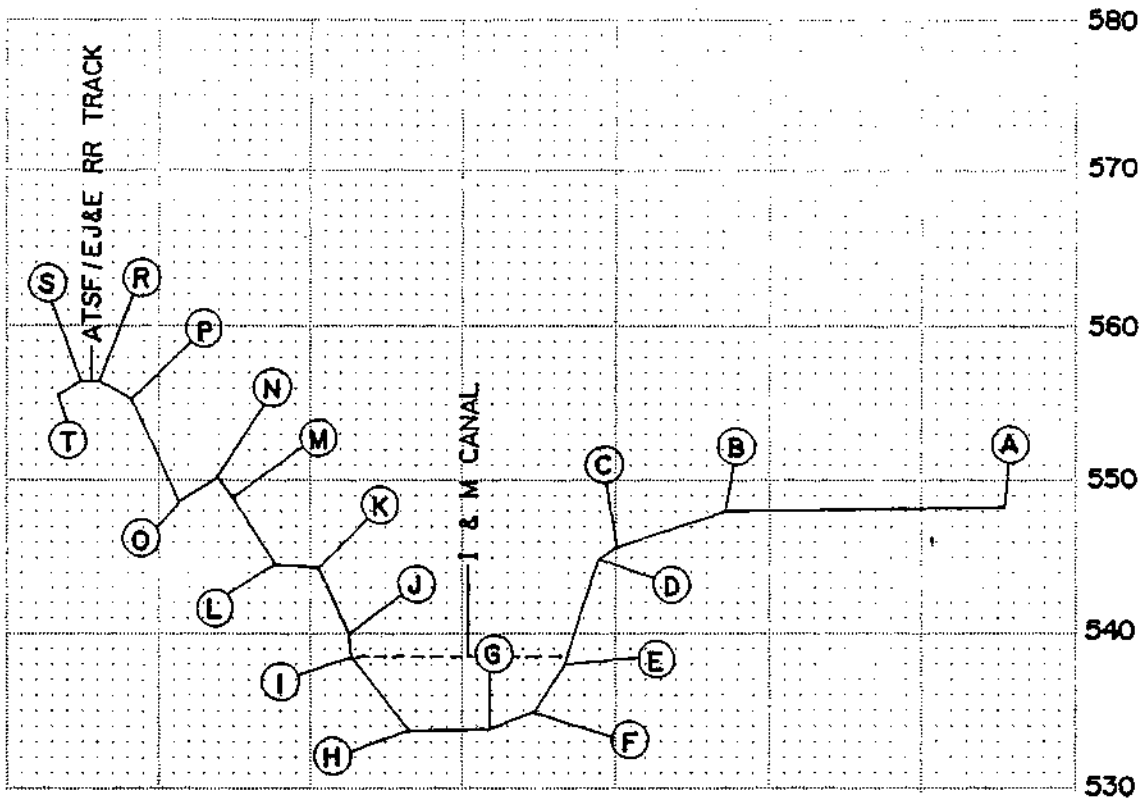


AZIMUTH = 107° 00' 09"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P50
DATE 3-13-89
NO. 089-39-02 T

SECTION 2B



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	3+97	548.2			
B	4+71	548.0			
C	5+00	545.7	1778330.800	570129.135	
D	5+03	545.0			
E	5+12	538.4			
F	5+21	535.0			
G	5+33	532.8			
H	5+54	533.7			
I	5+69	538.6			
J	5+70	540.4			
K	5+79	544.4			
L	5+90	544.7			
M	6+01	549.1			
N	6+05	550.1	1778358.790	570028.210	SEE TIE SHEET 03 T
O	6+15	548.7			
P	6+27	555.5			
R	6+35	556.6			
S	6+40	556.6			
T	6+48	555.6			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidl & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

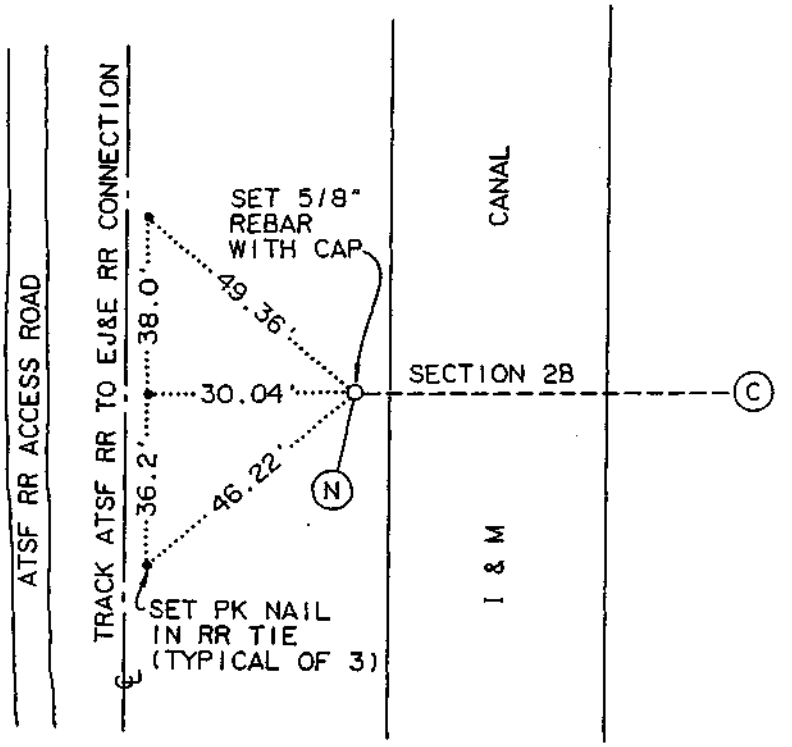
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB11 P33

DATE 4-24-89

NO. 089-39-03

TIE DIAGRAM
SECTION 2B (WEST)



AZIMUTH = 105° 30' 02"

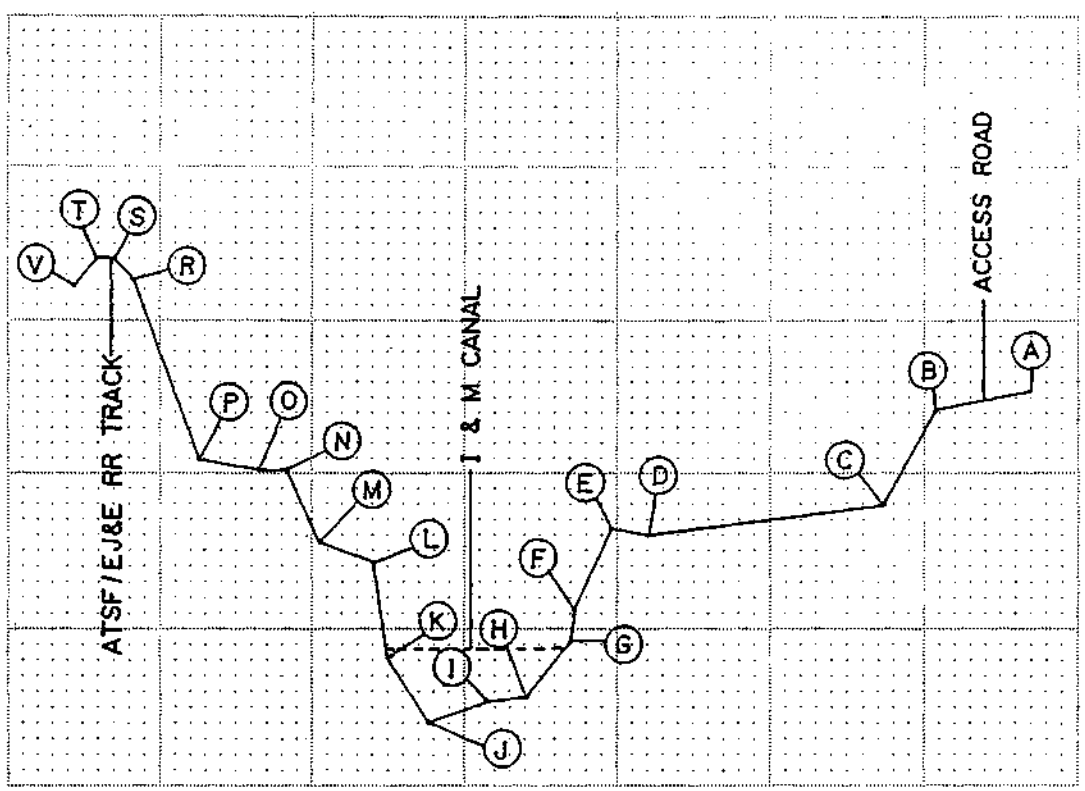
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P50

DATE 3-13-89

NO. 089-39-03 T

SECTION 3A



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	3+76	555.3			
B	4+07	554.1			
C	4+24	547.9			
D	5+00	545.9	1778987.240	570340.879	SEE TIE SHEET 04 T
E	5+12	546.3			
F	5+24	541.2			
G	5+25	539.3			
H	5+40	535.7			
I	5+53	535.4			
J	5+72	534.0			
K	5+85	538.1			
L	5+91	544.2			
M	6+09	545.4			
N	6+19	550.1			
O	6+28	550.2	1779032.370	570221.415	
P	6+48	550.9			
R	6+69	562.7			
S	6+76	564.0			
T	6+81	564.0			
V	6+88	562.2			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

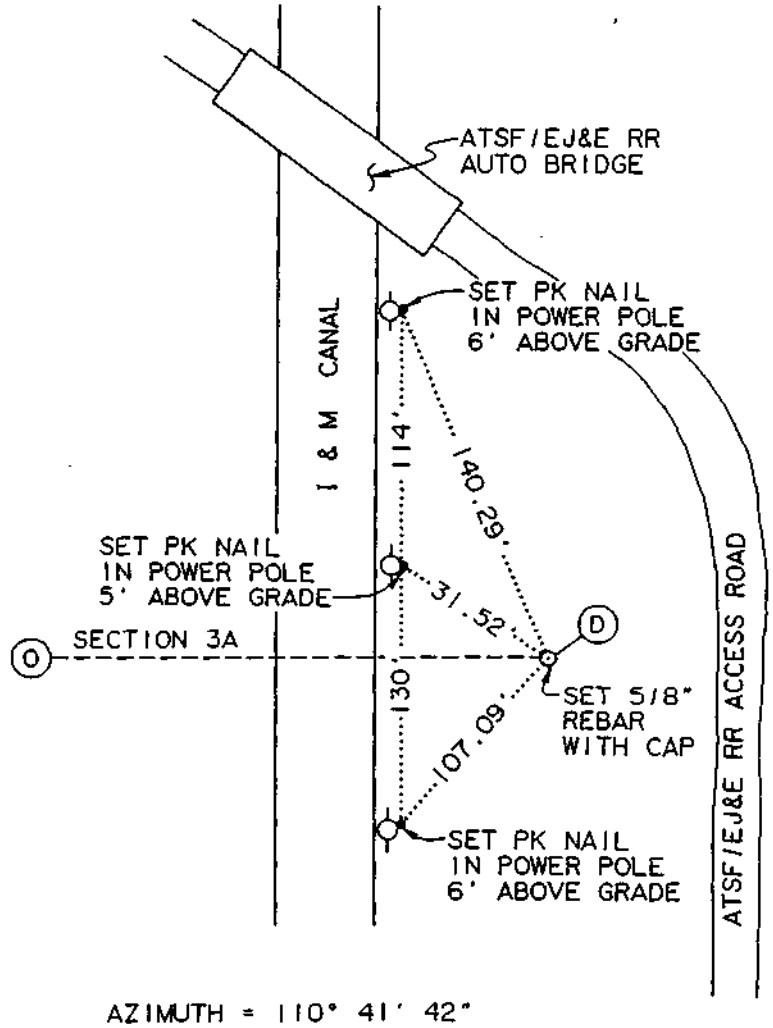
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P34

DATE 4-25-89

NO. 089-39-04

TIE DIAGRAM
SECTION 3A (EAST)



AZIMUTH = 110° 41' 42"

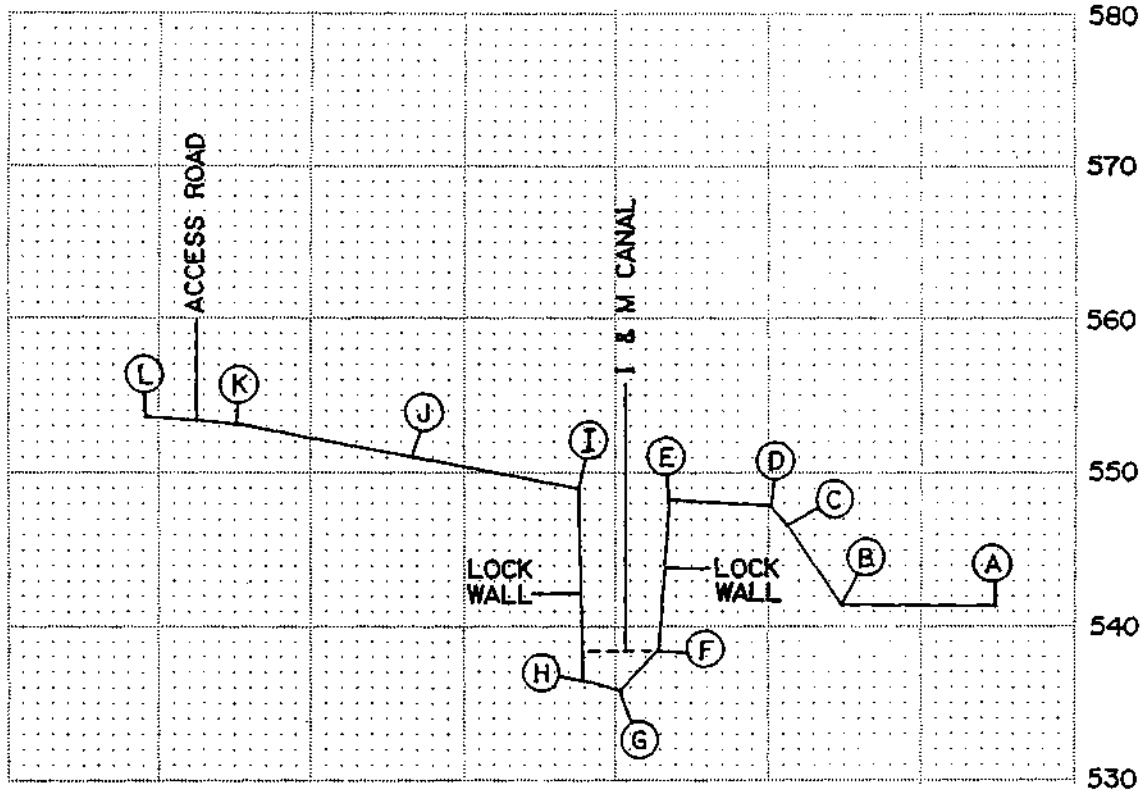
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB: P51

DATE 3-13-89

NO. 089-39-04 T

SECTION 3B



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+41	541.3			
B	4+81	541.1			
C	4+95	546.7			
D	5+00	547.8	1779434.130	570459.109	
E	5+28	548.1			
F	5+30	538.5			
G	5+39	535.8			
H	5+49	536.4			
I	5+50	548.9			
J	5+94	551.0	1779466.040	570371.128	SEE TIE SHEET 05 T
K	6+40	553.1			
L	6+64	553.5			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

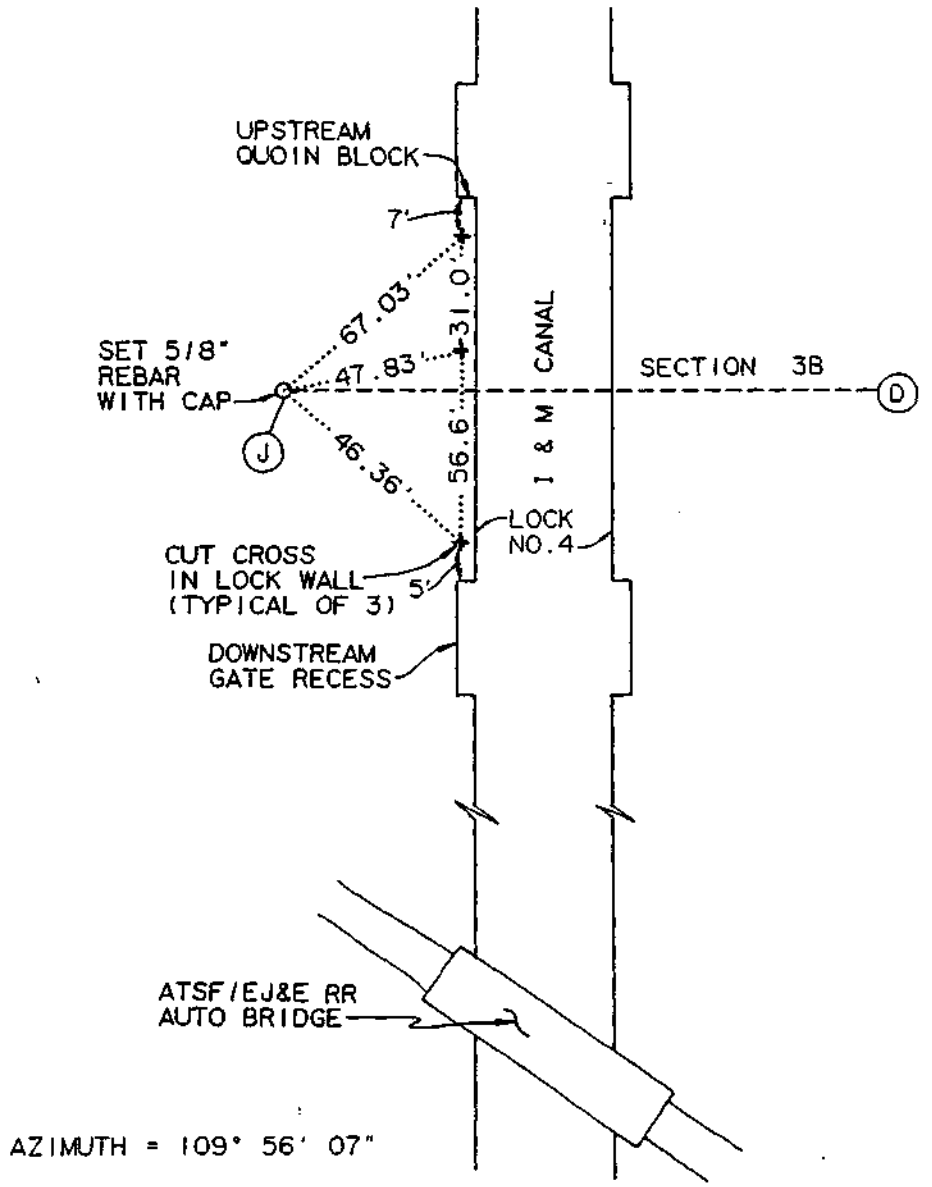
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P39

DATE 4-25-89

NO. 089-39-05

TIE DIAGRAM
SECTION 3B (WEST)



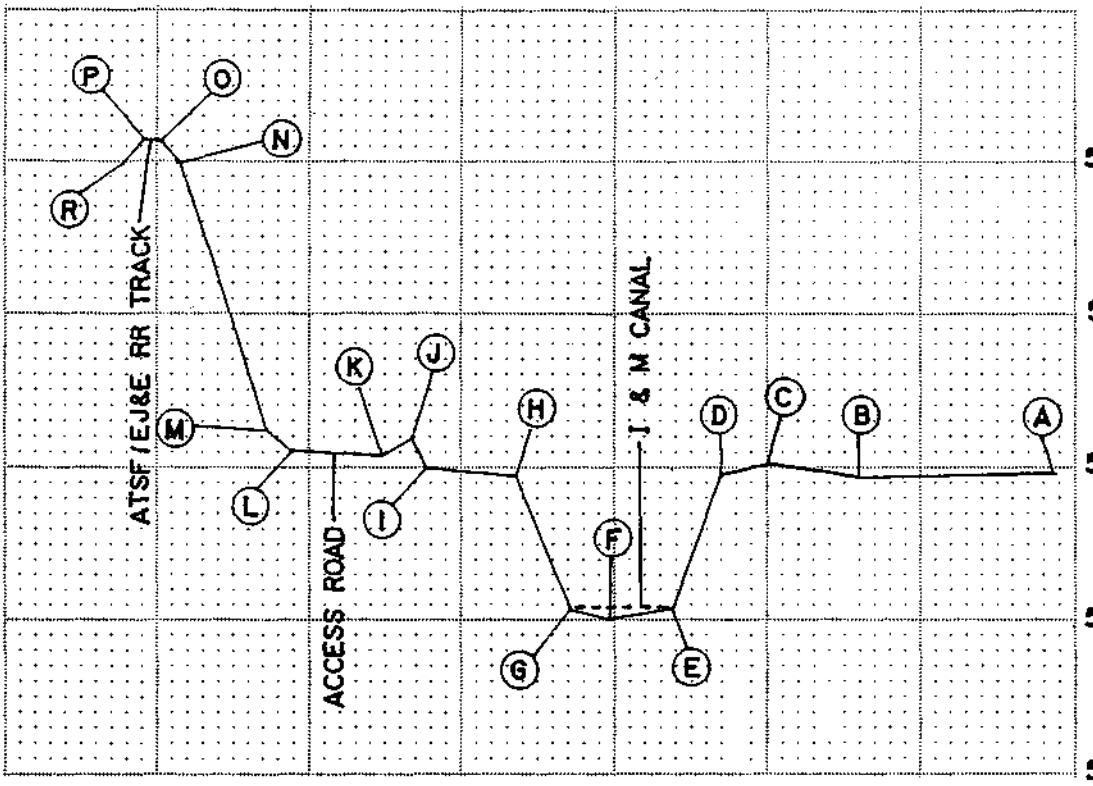
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB1 P51

DATE 3-13-89

NO. 089-39-05 T

SECTION 3C



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+07	549.6			
B	4+71	549.3			
C	5+00	550.2	1779731.320	570555.636	
D	5+16	549.5			
E	5+32	540.7			
F	5+47	540.0			
G	5+65	540.5			
H	5+83	549.5			
I	6+13	550.0			
J	6+16	551.9	1779763.780	570444.204	SEE TIE SHEET 06 T
K	6+26	550.8			
L	6+56	551.1			
M	6+64	552.4			
N	6+93	570.0			
O	6+99	571.3			
P	7+04	571.1			
R	7+11	569.8			

----INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidl & Associates for the U.S. Corps of Engineers.

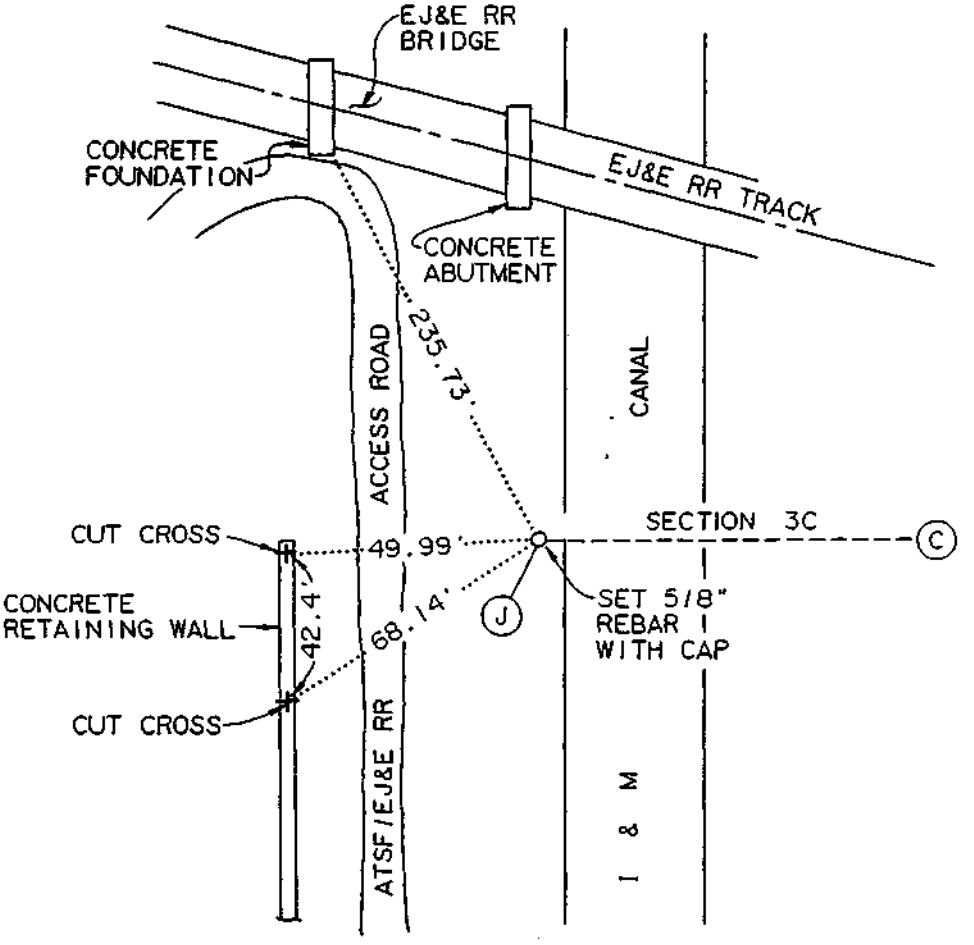
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P40

DATE 4-25-89

NO. 089-39-06

TIE DIAGRAM
SECTION 3C (WEST)



AZIMUTH = 106° 14' 27"

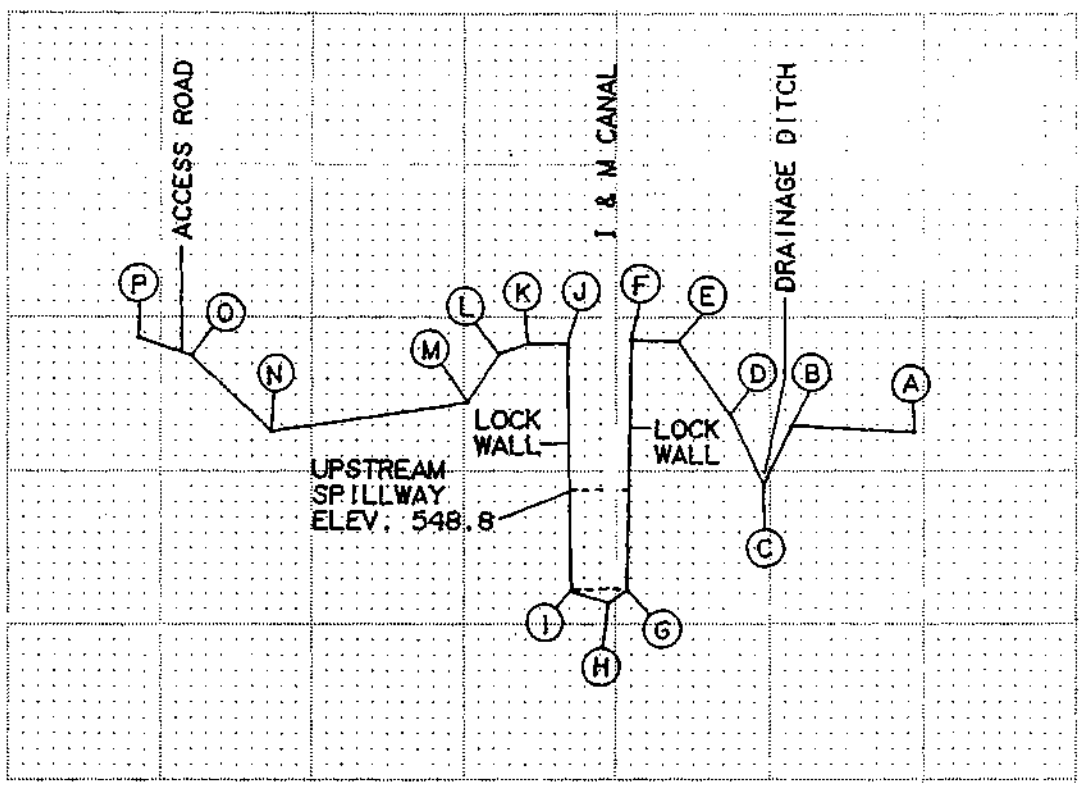
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB1 P52

DATE 3-13-89

NO. 089-39-06 T

SECTION 3D



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+23	552.4			
B	4+63	552.9			
C	4+72	549.1			
D	4+83	553.7			
E	5+00	558.4	1780069.240	570635.160	
F	5+15	558.5			
G	5+17	542.3			
H	5+23	541.4			
I	5+35	542.2			
J	5+36	558.1			
K	5+50	558.3	1780093.510	570587.707	SEE TIE SHEET 07 T
L	5+59	557.7			
M	5+69	554.4			
N	6+34	552.8			
O	6+60	557.6			
P	6+78	558.7			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

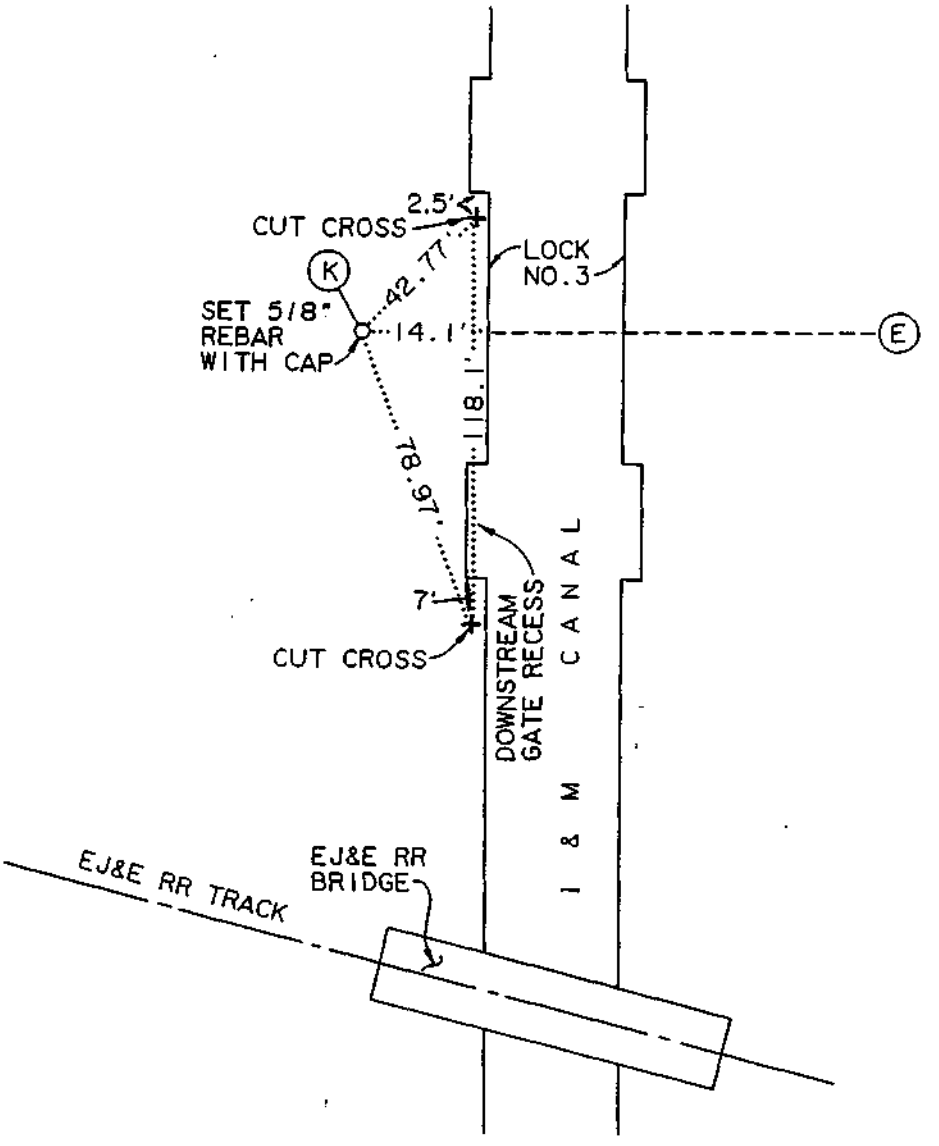
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P41

DATE 4-25-89

NO. 089-39-07

TIE DIAGRAM
SECTION 3D (WEST)



AZIMUTH = 106° 44' 13"

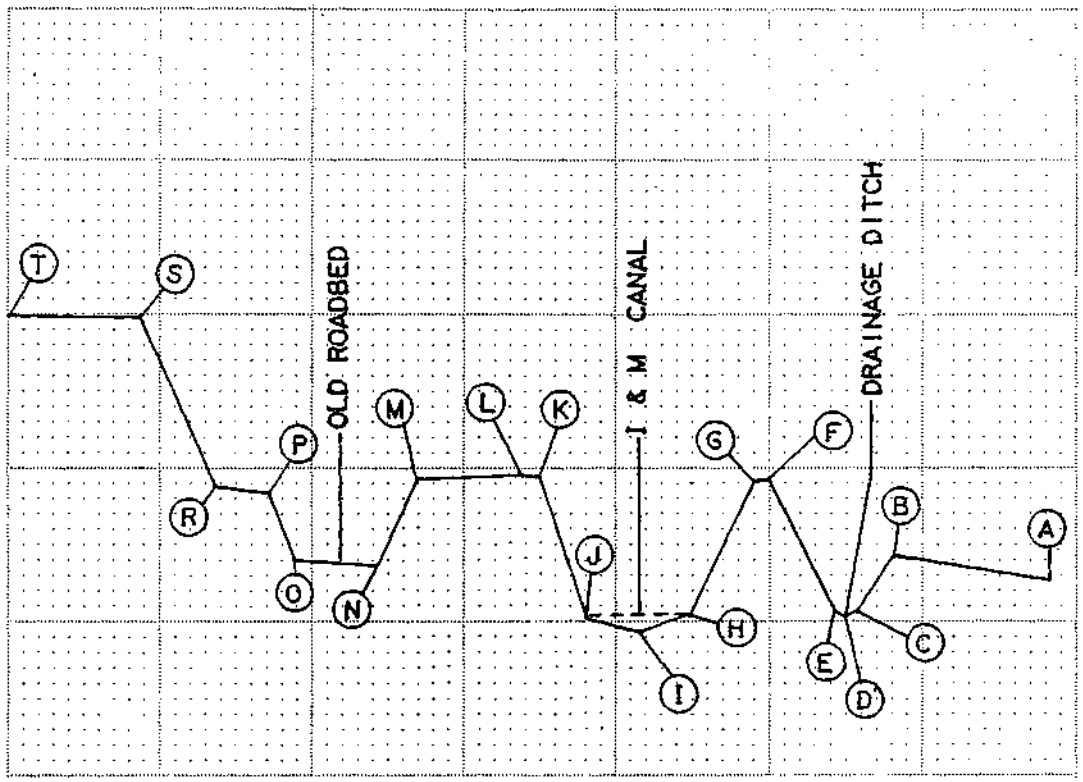
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB| P52

DATE 3-13-89

NO. 089-39-07 T

SECTION 3E



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+09	552.6			
B	4+61	554.2			
C	4+72	550.8			
D	4+76	550.2			
E	4+80	550.8			
F	5+00	559.2	1780346.200	570733.298	SEE TIE SHEET 08 T
G	5+04	559.1			
H	5+26	550.3			
I	5+42	549.3			
J	5+60	550.1			
K	5+76	559.4			
L	5+81	559.6	1780360.720	570653.781	
M	6+15	559.3			
N	6+28	553.6			
O	6+56	554.0			
P	6+64	558.2			
R	6+82	558.8			
S	7+06	569.5			
T	7+70	569.9			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

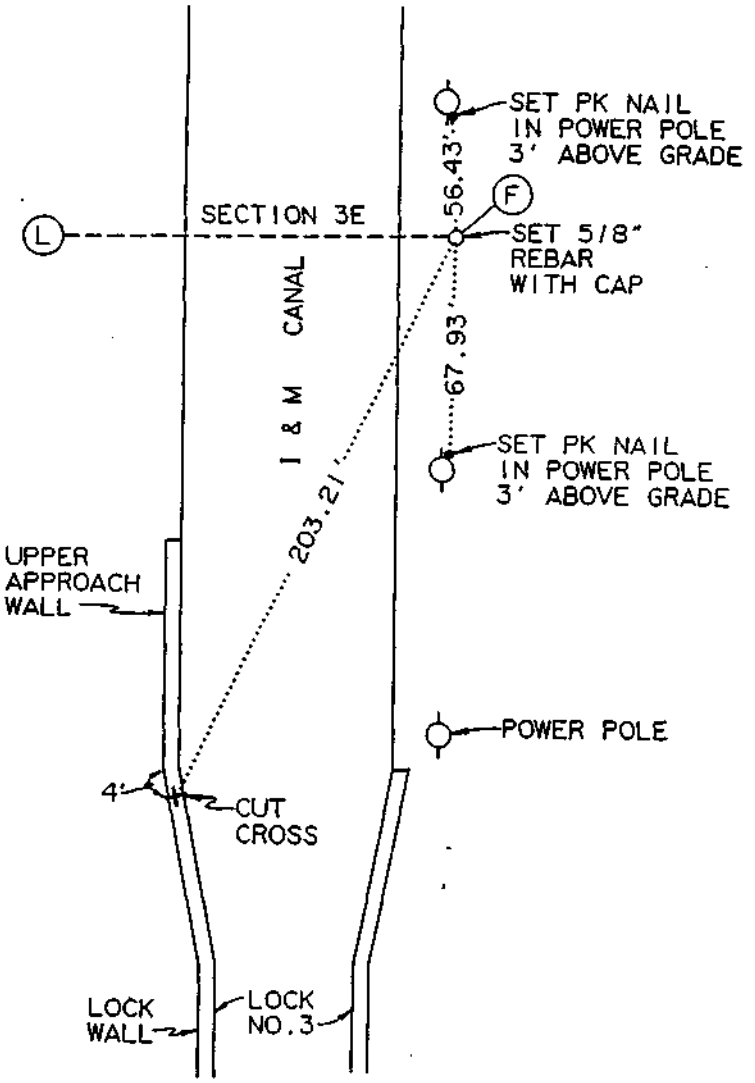
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P50

DATE 4-28-89

NO. 089-39-08

TIE DIAGRAM
SECTION 3E (EAST)

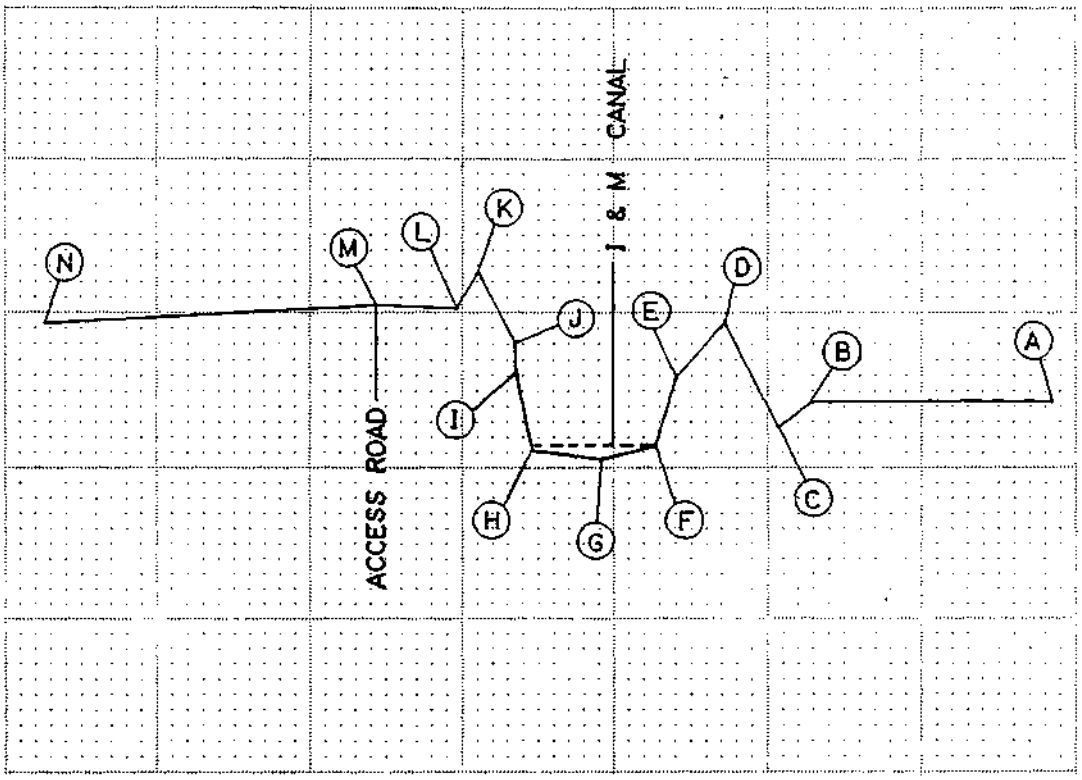


AZIMUTH = 100° 20' 54"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB1 P53
DATE 3-14-89
NO. 089-39-08 T

SECTION 4A



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	3+93	554.3			
B	4+73	554.3			
C	4+82	552.7			
D	5+00	559.4	1781187.770	570984.769	SEE TIE SHEET 09 T
E	5+17	555.8			
F	5+22	551.3			
G	5+40	550.4			
H	5+61	551.2			
I	5+68	556.2			
J	5+69	558.0			
K	5+81	562.5	1781217.430	570909.374	
L	5+87	560.2			
M	6+14	560.6			
N	7+23	559.3			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidl & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

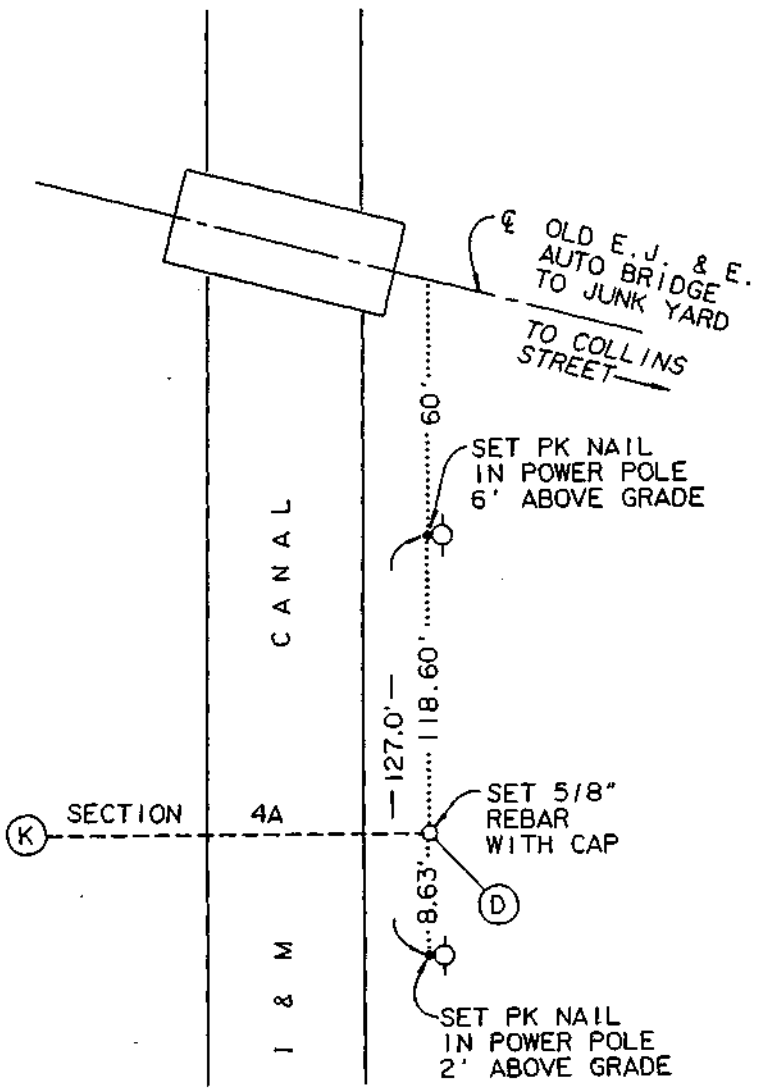
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P49

DATE 4-26-89

NO. 089-39-09

TIE DIAGRAM
SECTION 4A (EAST)

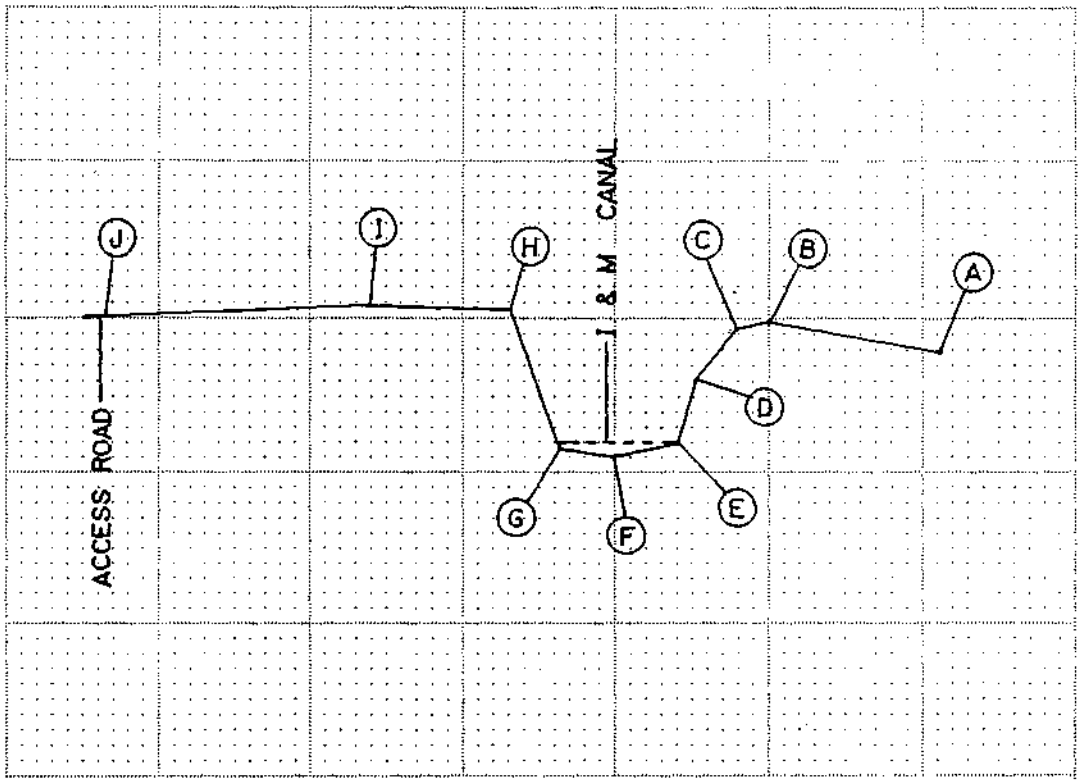


AZIMUTH = 111° 28' 28"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P53
DATE 3-14-89
NO. 089-39-09 T

SECTION 4B



MARK	LINE STATION	ELEVATION	COORDINATES N	E
A	4+45	557.8		
B	5+00	559.8	1781390.530	571054.317
C	5+11	559.3		
D	5+24	556.1		
E	5+30	551.9		
F	5+51	551.0		
G	5+69	551.6		
H	5+84	560.5	1781424.640	570977.317
I	6+31	560.8		
J	7+18	560.1		

SEE TIE SHEET 10 T

----INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

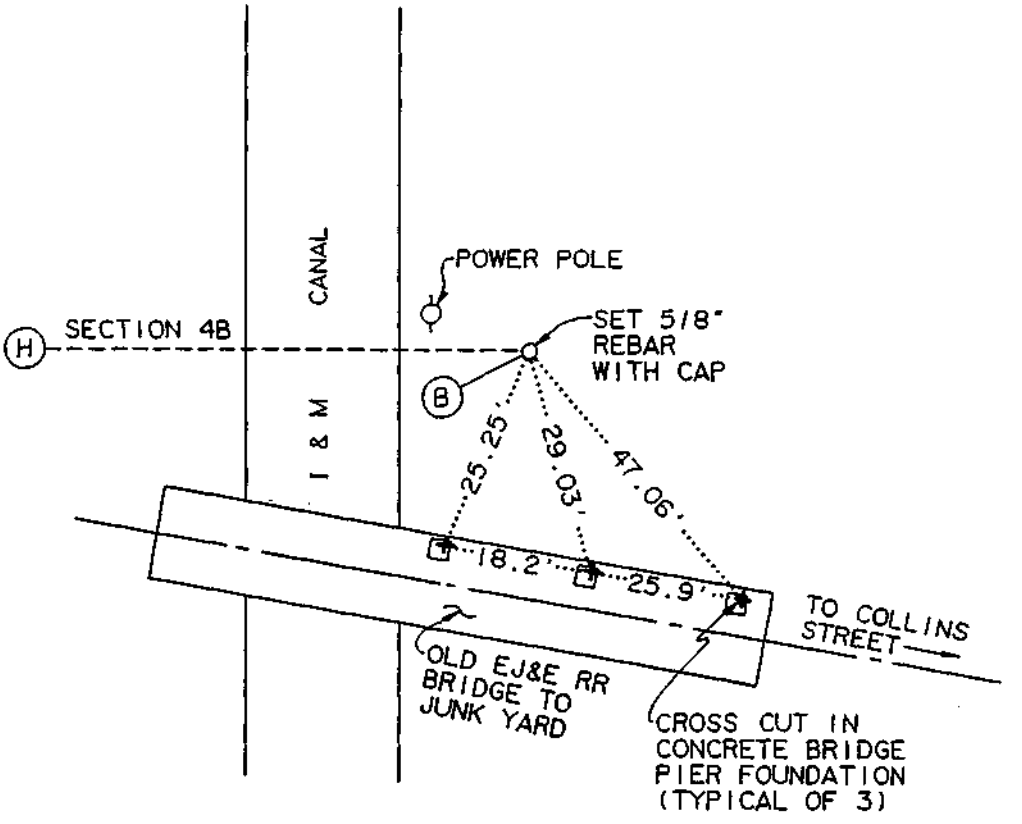
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB11 P51

DATE 4-28-89

NO. 089-39-10

TIE DIAGRAM
SECTION 4B (EAST)



AZIMUTH = 113° 53' 34"

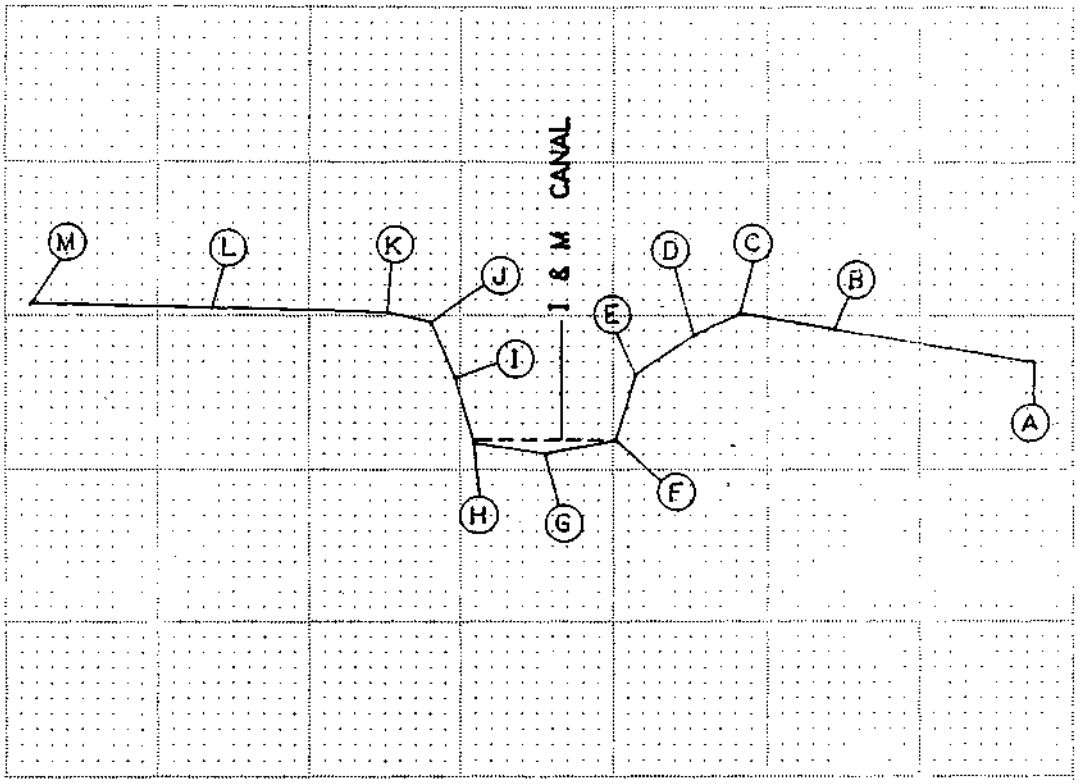
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P54

DATE 3-14-89

NO. 089-39-10 T

SECTION 4C



MARK	LINE STATION	ELEVATION	COORDINATES N	E
A	4+22	556.9		
B	4+75	559.1		
C	5+00	560.1	1781610.090	571122.184
D	5+13	558.7		
E	5+27	556.0		
F	5+32	551.9		
G	5+50	551.0		
H	5+69	551.7		
I	5+73	555.9		
J	5+80	559.4		
K	5+92	560.1	1781641.040	571035.774
L	6+38	560.5		
M	6+86	560.8		

SEE TIE SHEET 11 T

----- INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

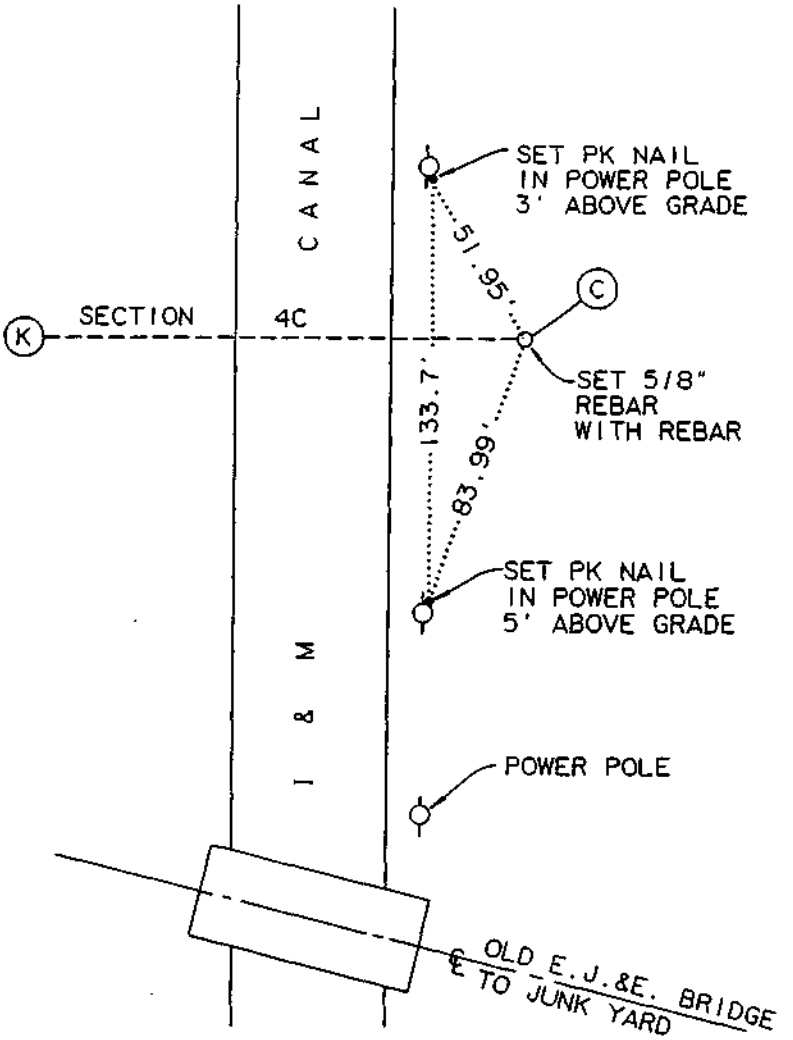
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB11 P52

DATE 4-28-89

NO. 089-39-11

TIE DIAGRAM
SECTION 4C (EAST)

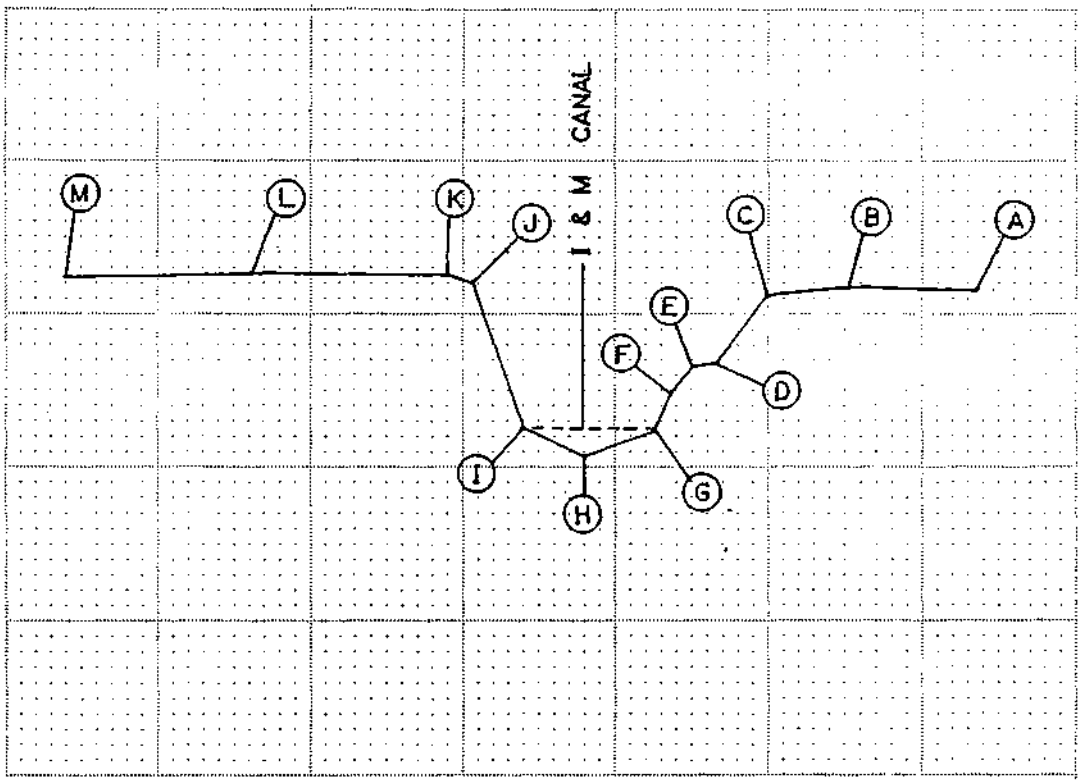


AZIMUTH = 109° 42' 23"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB1 P54
DATE 3-14-89
NO. 089-39-11 T

SECTION 5A



MARK	LINE STATION	ELEVATION	COORDINATES N	E
A	4+26	561.5		
B	4+59	561.7		
C	4+81	561.2		
D	4+94	556.8		
E	5+00	556.5	1782561.230	571376.417 SEE TIE SHEET 12 T
F	5+06	554.8		
G	5+10	552.3		
H	5+28	550.7		
I	5+44	552.4		
J	5+57	562.0		
K	5+65	562.5	1782577.210	571313.716
L	6+17	562.7		
M	6+64	562.3		

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

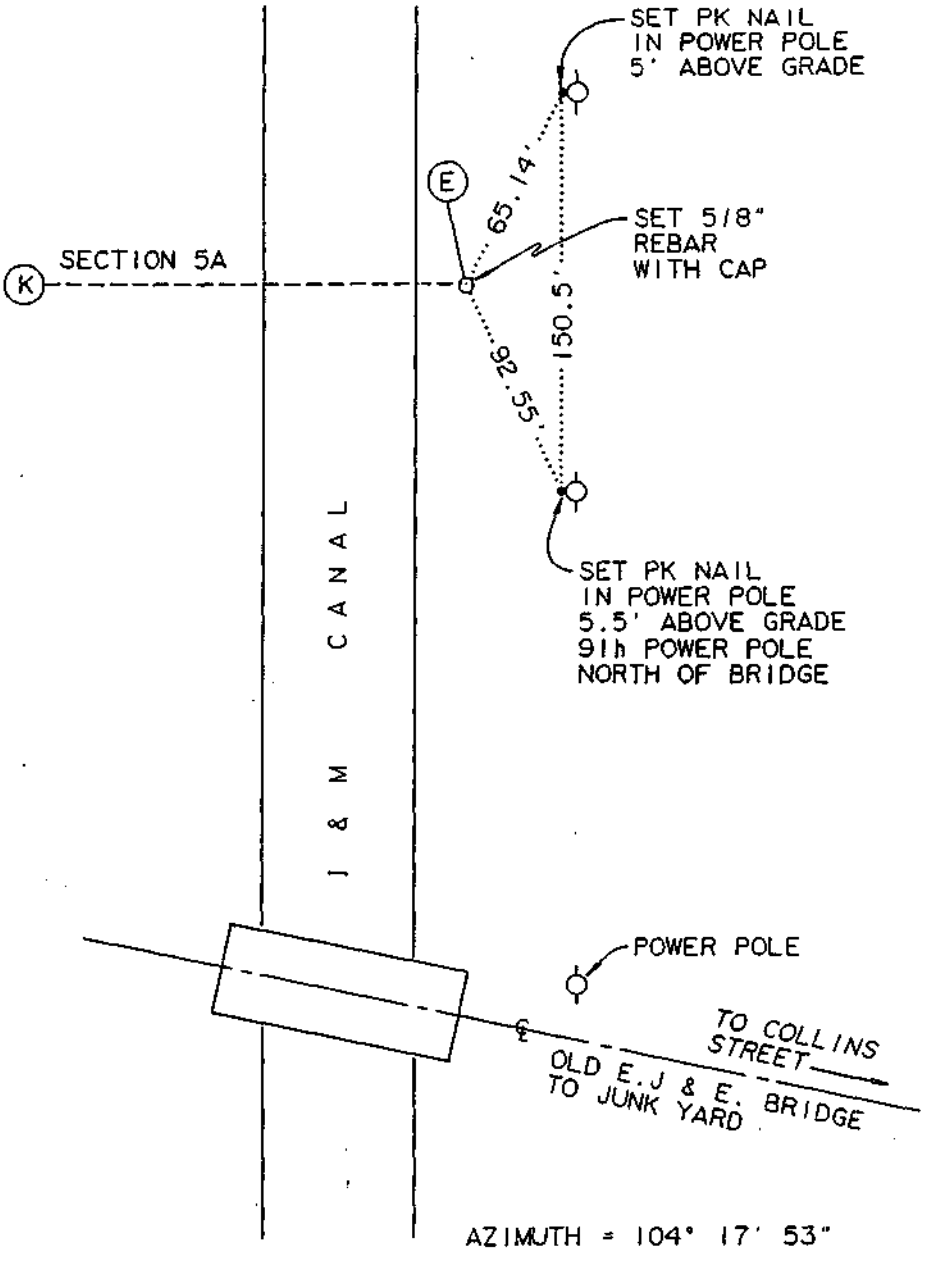
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB11 P53

DATE 5-1-89

NO. 089-39-12

TIE DIAGRAM
SECTION 5A (EAST)



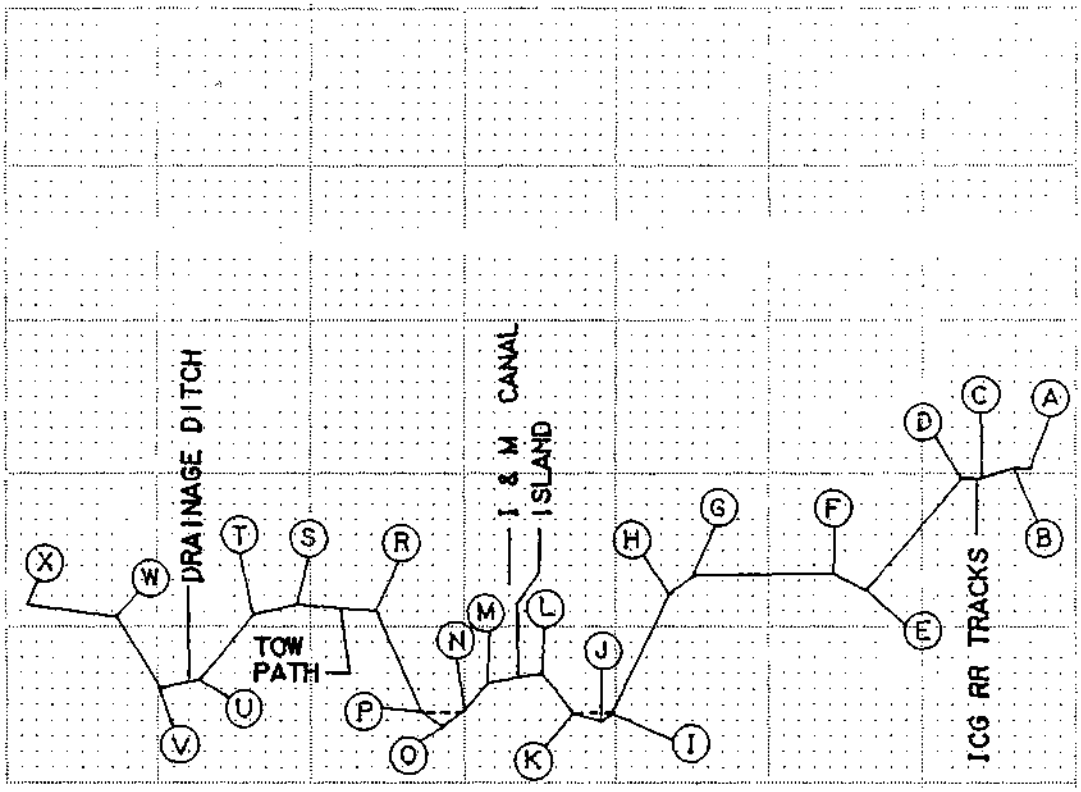
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P54

DATE 3-14-89

NO. 089-39-12 T

SECTION 6A



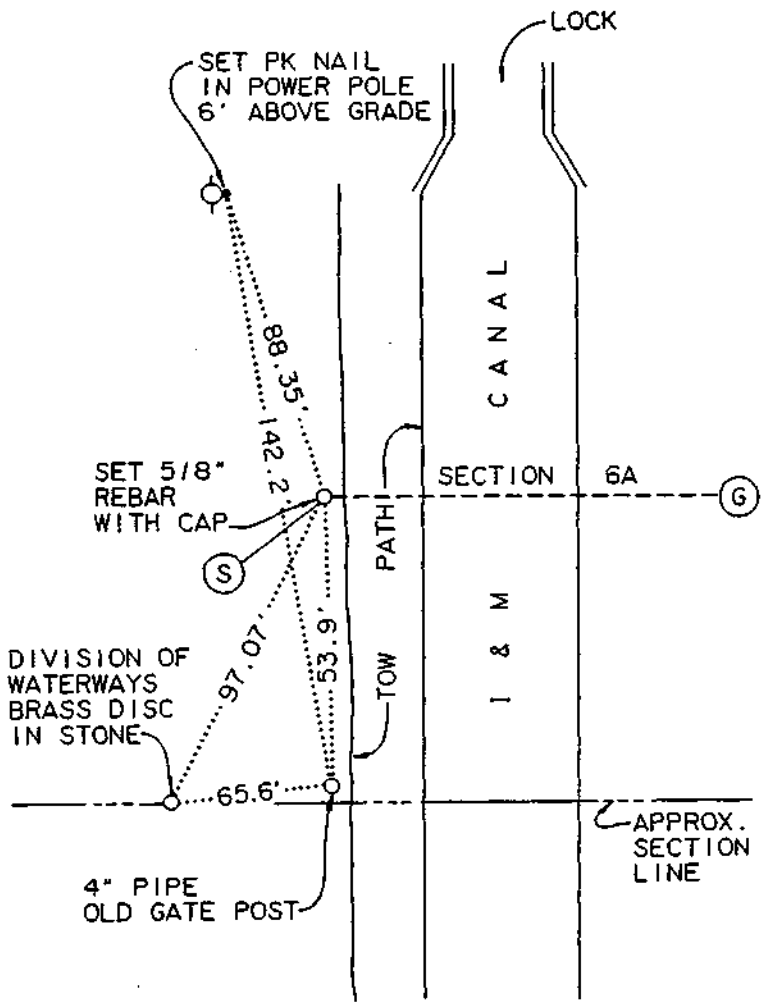
MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+12	570.2			
B	4+17	570.2			
C	4+25	569.7			
D	4+30	569.7			
E	4+55	562.3			
F	4+63	563.4			
G	5+00	563.2	1785109.500	572168.788	SEE TIE SHEET 13 T
H	5+07	562.1			
I	5+21	554.4			
J	5+25	553.9			
K	5+31	554.3			
L	5+40	557.0			
M	5+54	556.3			
N	5+61	554.5			
O	5+66	553.7			
P	5+72	554.5			
R	5+84	561.0			
S	6+04	561.3	1785138.160	572068.654	
T	6+16	560.9			
U	6+30	556.5			
V	6+40	556.1			
W	6+52	560.6			
X	6+76	561.3			

----- INDICATES WATER LEVEL

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB11 P54
DATE 5-1-89
NO. 089-39-13

TIE DIAGRAM
SECTION 6A (WEST)



AZIMUTH = 105° 58' 19"

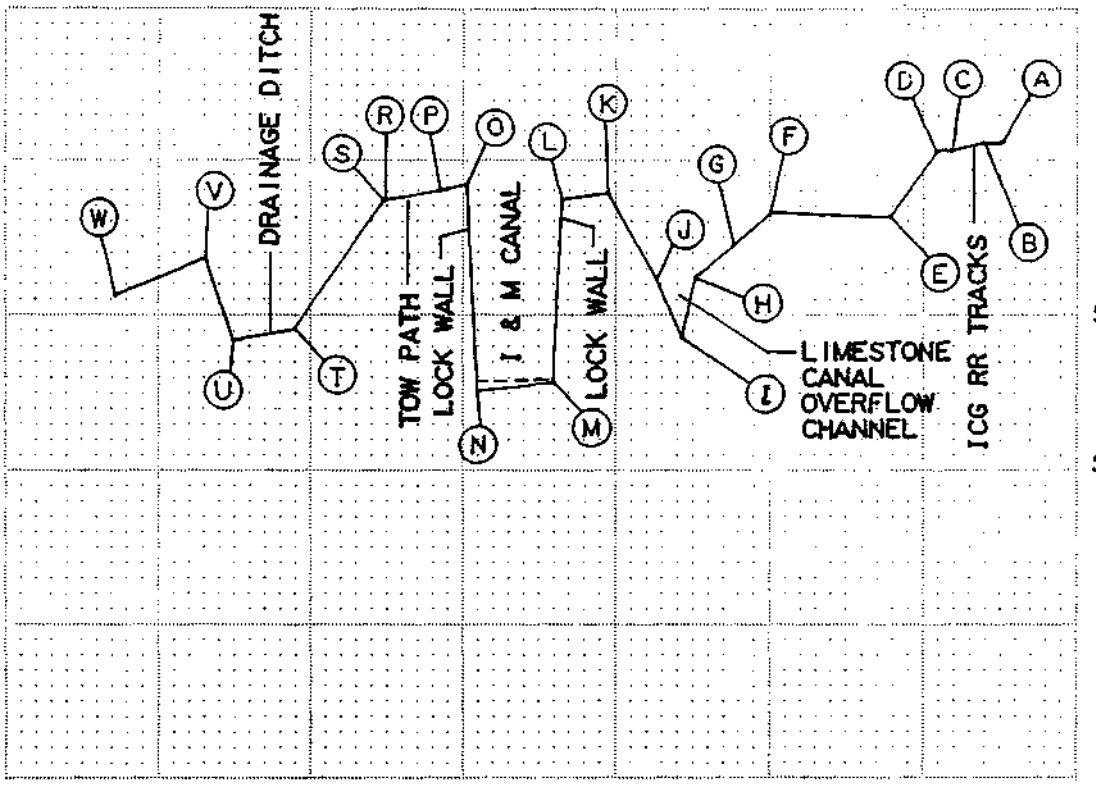
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB1 P38

DATE 3-14-89

NO. 089-39-13 T

SECTION 6B



MARK	LINE STATION	ELEVATION	COORDINATES N	E
A	4+40	571.2		
B	4+44	571.1		
C	4+53	570.6		
D	4+58	570.6		
E	4+69	566.2		
F	5+00	566.5	1785341.450	572259.485
G	5+10	564.6		
H	5+20	562.4		
I	5+23	558.5		
J	5+30	562.3		
K	5+43	567.9		
L	5+55	567.4		
M	5+57	555.7		
N	5+77	555.1		
O	5+79	568.4		
P	5+86	568.0		
R	6+01	567.3		
S	6+01	567.3	1785367.410	572161.480
T	6+25	559.1		
U	6+41	558.3		
V	6+48	563.7		
W	6+71	561.2		

----- INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

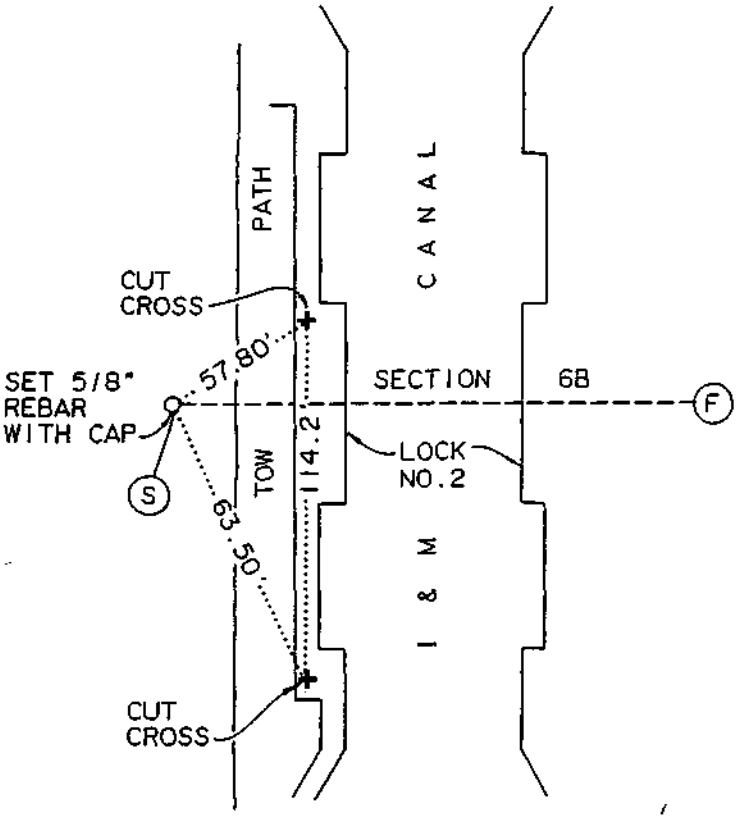
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P55

DATE 5-1-89

NO. 089-39-14

TIE DIAGRAM
SECTION 6B (WEST)



AZIMUTH = 104° 50' 10"

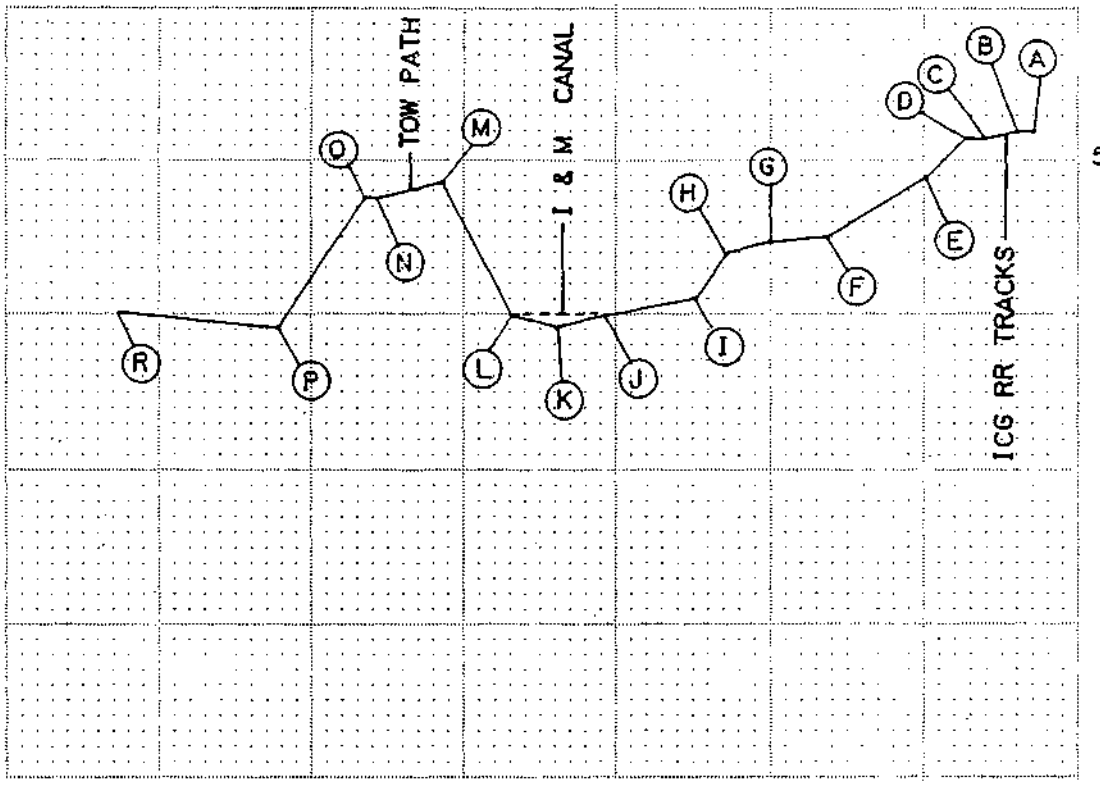
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P55

DATE 3-14-89

NO. 089-39-14 T

SECTION 6C



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+32	571.9			
B	4+37	571.9			
C	4+45	571.4			
D	4+50	571.4			
E	4+60	568.9			
F	4+86	565.0			
G	5+00	564.7	1785569.140	572312.405	
H	5+12	563.9			
I	5+20	561.0			
J	5+44	559.9			
K	5+55	559.2			
L	5+68	559.9			
M	5+86	568.6			
N	6+04	567.5			
O	6+07	567.6	1785599.340	572209.582	SEE TIE SHEET 15 T
P	6+29	559.1			
R	6+71	560.1			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

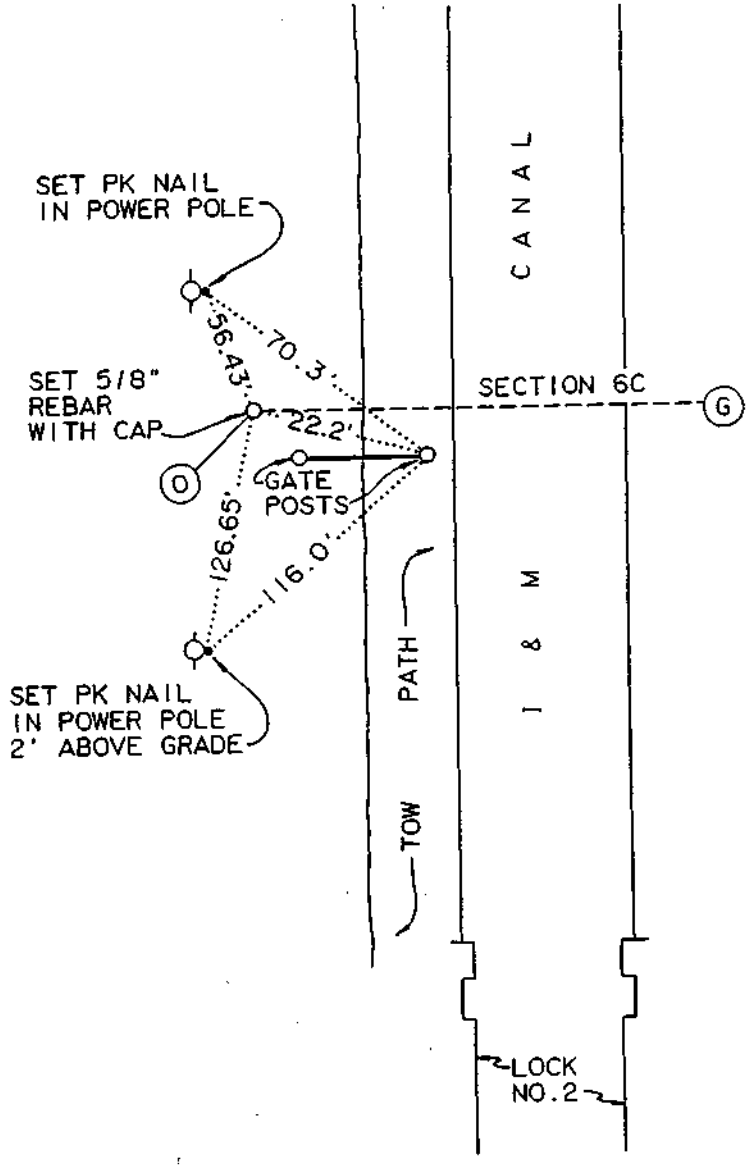
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB11 P56

DATE 5-1-89

NO. 089-39-15

TIE DIAGRAM
SECTION 6C (WEST)



AZIMUTH = 106° 22' 05"

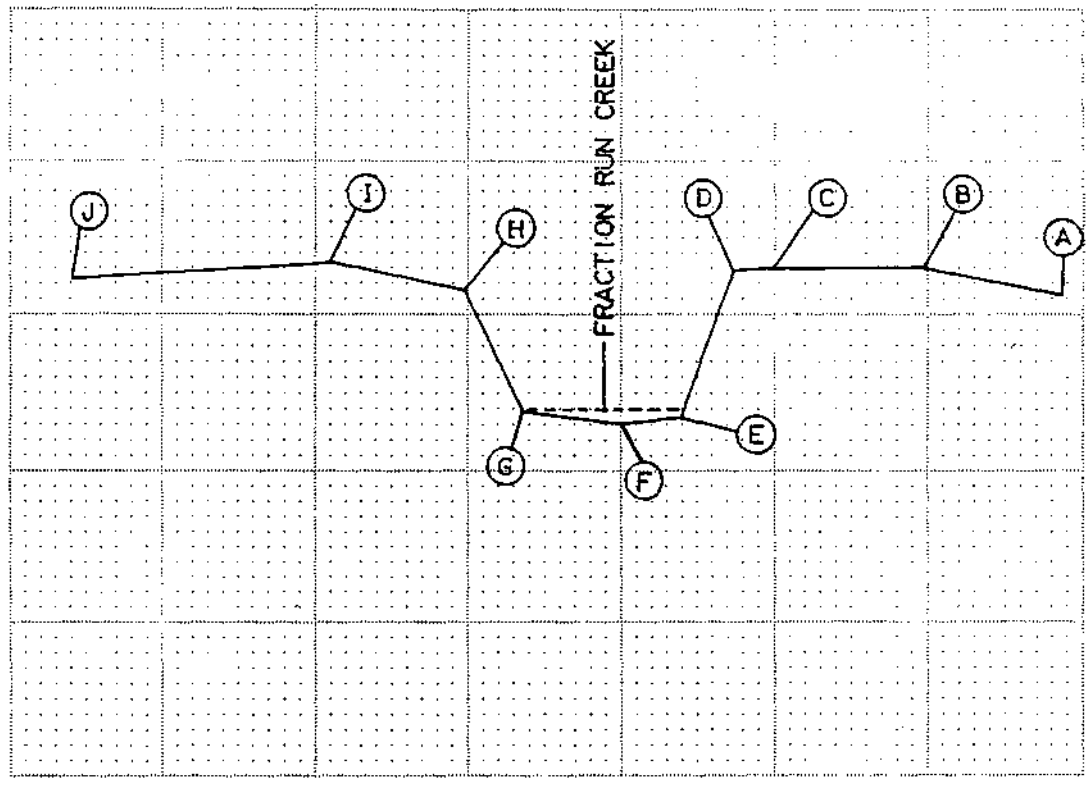
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

F81 P55

DATE 3-14-89

NO. 089-39-15 T

SECTION 7A



MARK	LINE STATION	ELEVATION	COORDINATES N	E
A	4+26	571.2		
B	4+62	573.0		
C	5+00	573.8	1786862.770	572695.922 SEE TIE SHEET 16 T
D	5+11	572.9		
E	5+24	563.4		
F	5+40	563.0		
G	5+67	563.9		
H	5+81	571.5		
I	6+17	573.2		
J	6+84	572.2		

----INDICATES WATER LEVEL

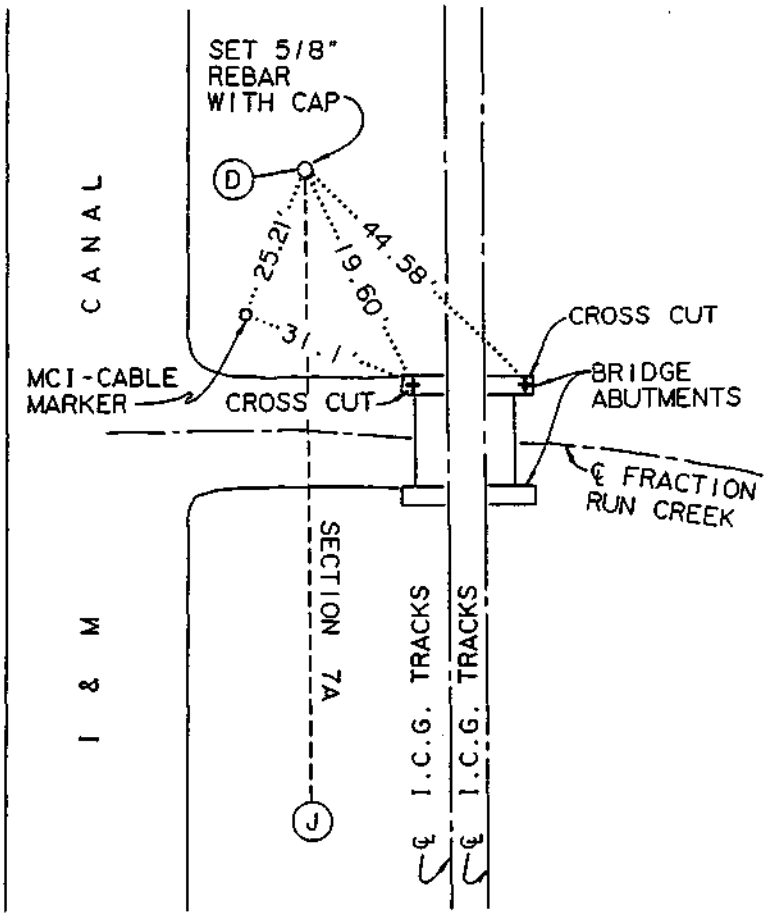
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P57

DATE 5-2-89

NO. 089-39-16

TIE DIAGRAM
SECTION 7A (NORTH)



AZIMUTH = 14° 55' 06"

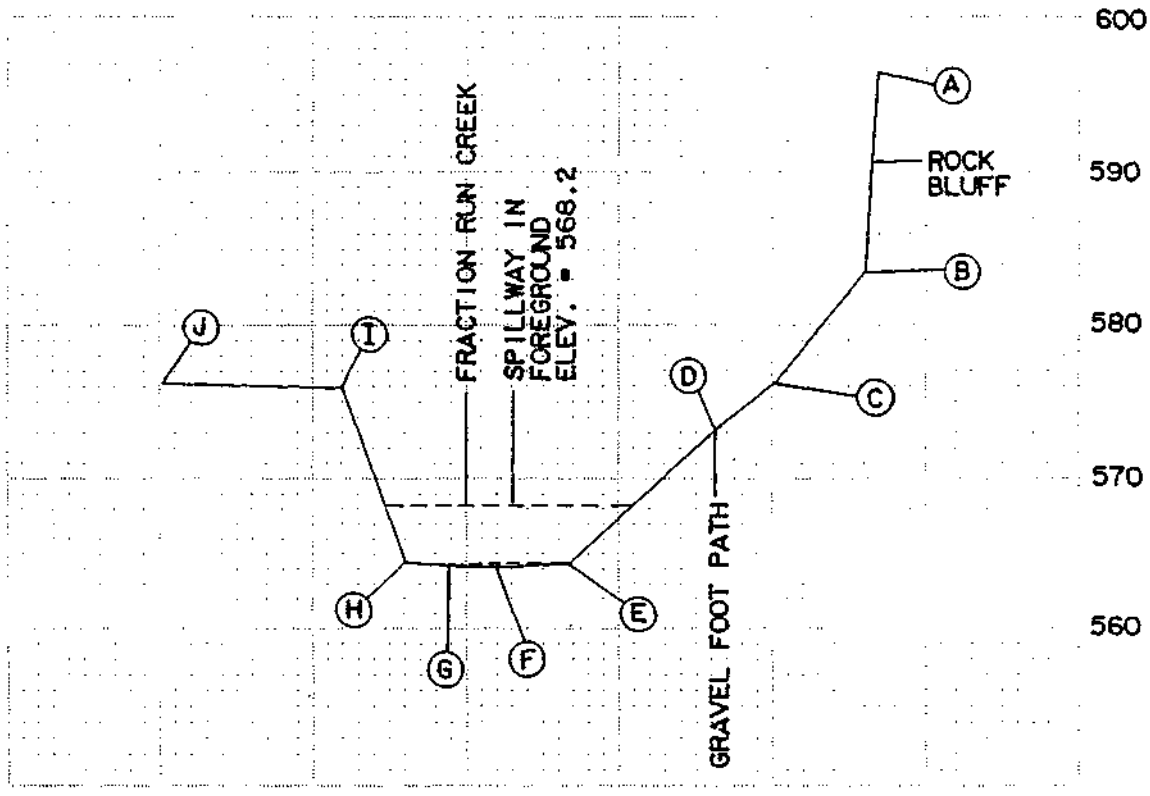
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P56

DATE 3-14-89

NO. 089-39-16 T

SECTION 7B



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+73	596.7			
B	4+77	583.6			
C	5+00	576.3	1786847.620	572774.599	SEE TIE SHEET 17 T
D	5+16	573.5			
E	5+54	564.4			
F	5+73	564.2			
G	5+86	564.3			
H	5+97	564.9			
I	6+12	576.0			
J	6+61	576.1			

----- INDICATES WATER LEVEL

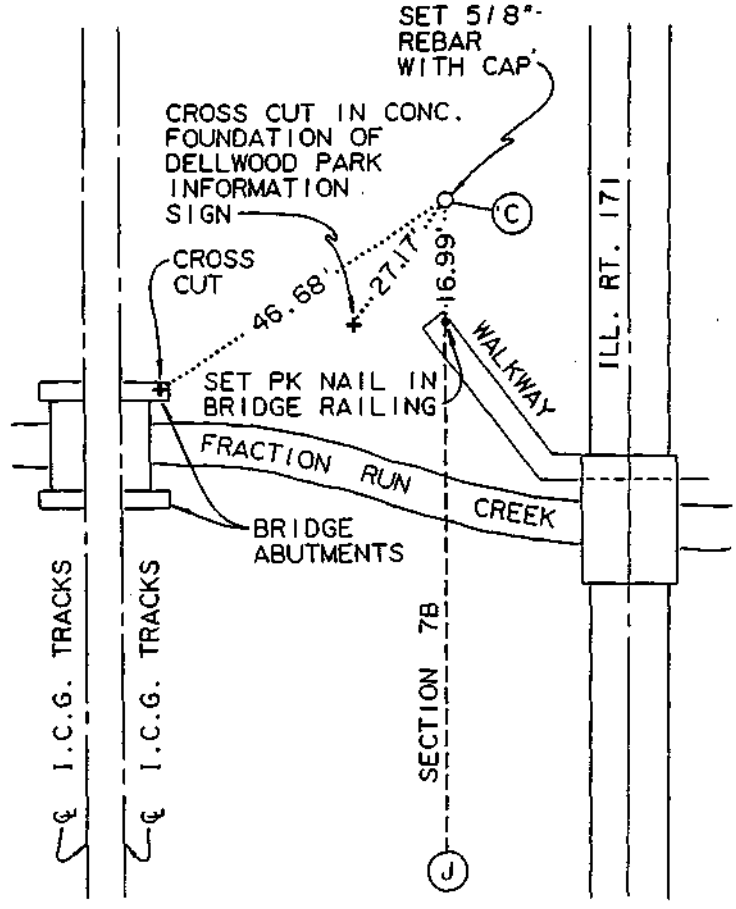
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB11 P57

DATE 5-2-89

NO. 089-39-17

TIE DIAGRAM
SECTION 7B (NORTH)



AZIMUTH = 17° 08' 52"

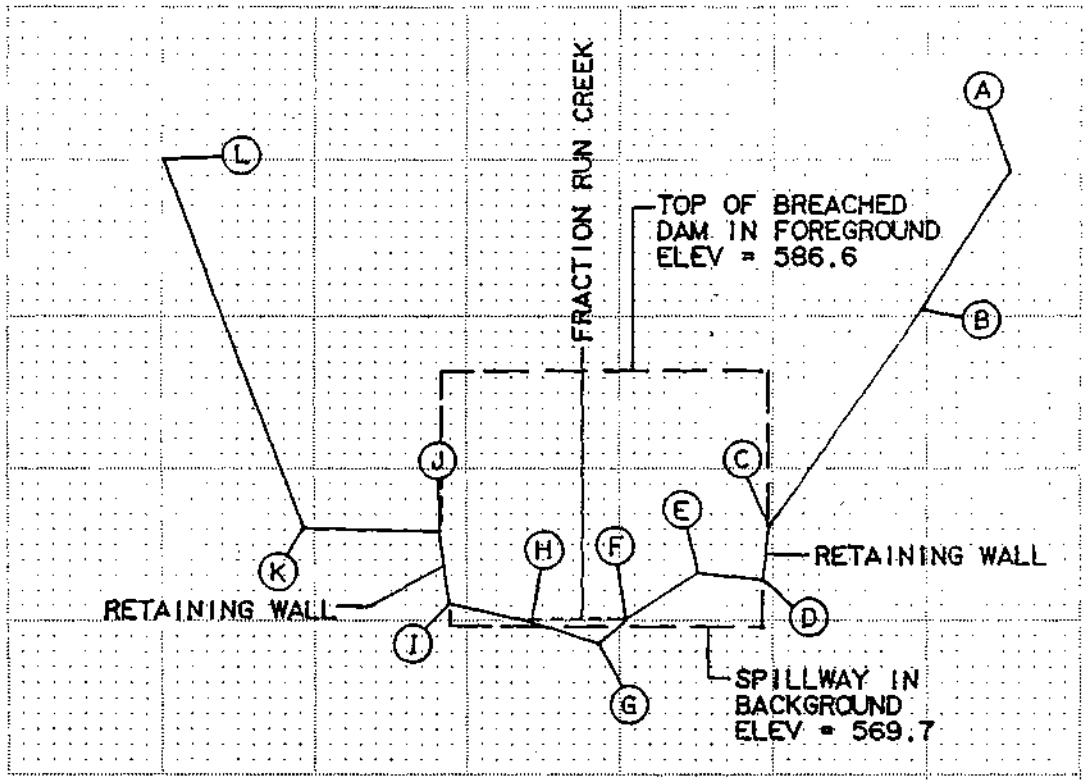
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI PSG

DATE 3-14-89

NO. 089-39-17 T

SECTION 7C



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+19	599.2			
B	4+41	590.3			
C	4+81	576.1			
D	4+83	572.7			
E	5+00	573.1	1786697.680	572878.757	SEE TIE SHEET 18 T
F	5+19	570.0			
G	5+26	568.6			
H	5+43	569.9			
I	5+65	571.1			
J	5+67	575.8			
K	6+03	576.1			
L	6+40	600.2			

----INDICATES WATER LEVEL

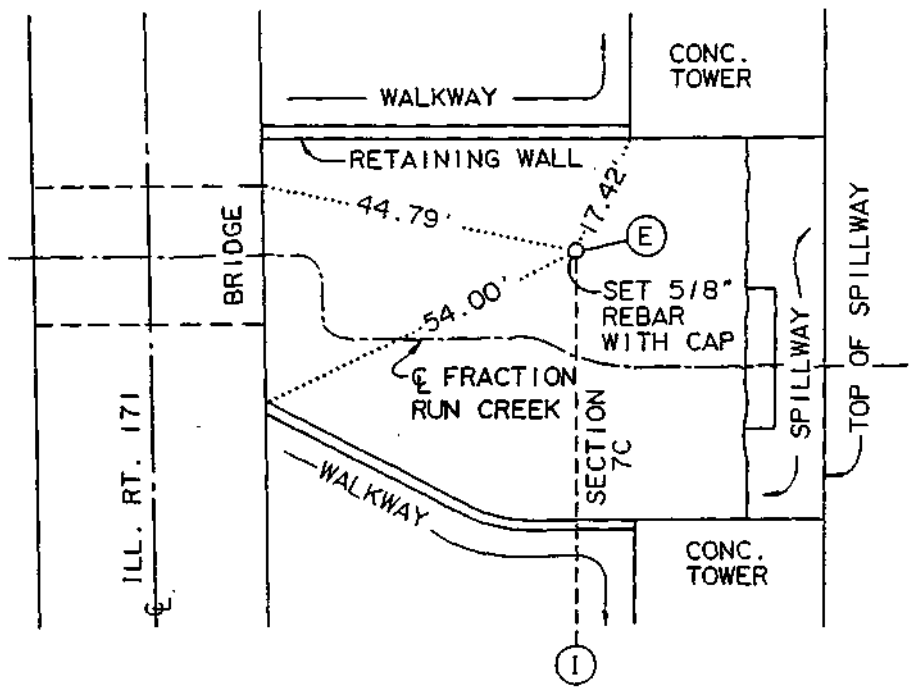
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB11 P58

DATE 5-2-89

NO. 089-39-18

TIE DIAGRAM
SECTION 7C (NORTH)

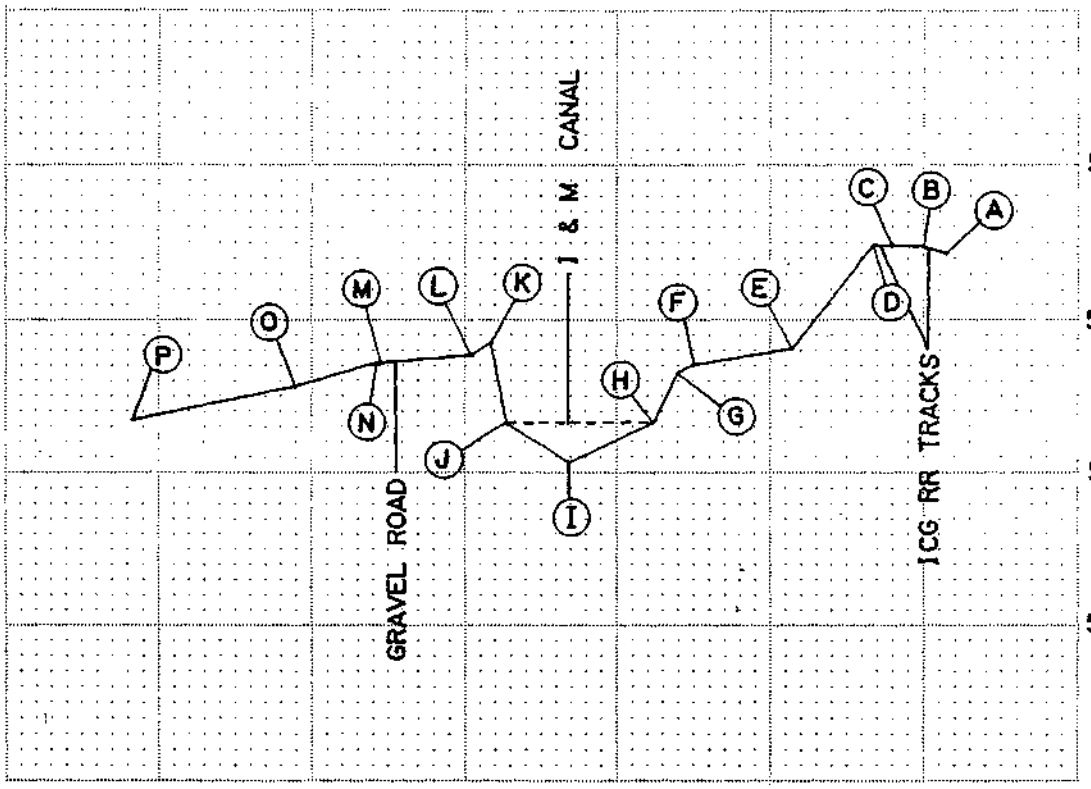


AZIMUTH = 24° 48' 42"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P56
DATE 3-14-89
NO. 089-39-18 T

SECTION 8A



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+34	574.3			
B	4+40	574.7			
C	4+48	574.6			
D	4+53	575.0			
E	4+74	568.1			
F	5+00	567.0	1787576.314	572885.796	
G	5+04	566.6			
H	5+10	563.2			
I	5+32	560.8			
J	5+49	563.2			
K	5+53	568.5			
L	5+57	567.8			
M	5+82	567.3			
N	5+82	567.3	1787600.586	572807.775	SEE TIE SHEET 19 T
O	6+05	565.7			
P	6+47	563.6			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----- INDICATES WATER LEVEL

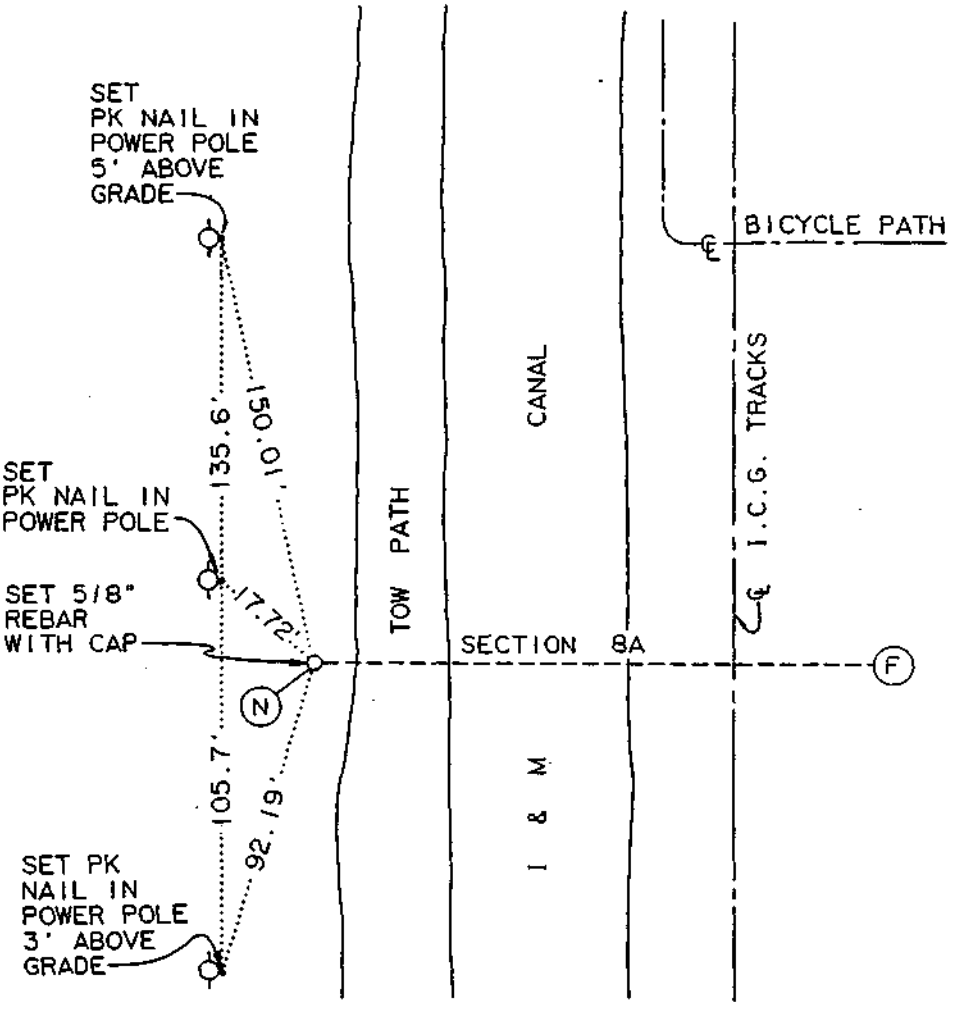
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

F811 P59

DATE 5-2-89

NO. 089-39-19

TIE DIAGRAM
SECTION 8A (WEST)



AZIMUTH = 107° 16' 49"

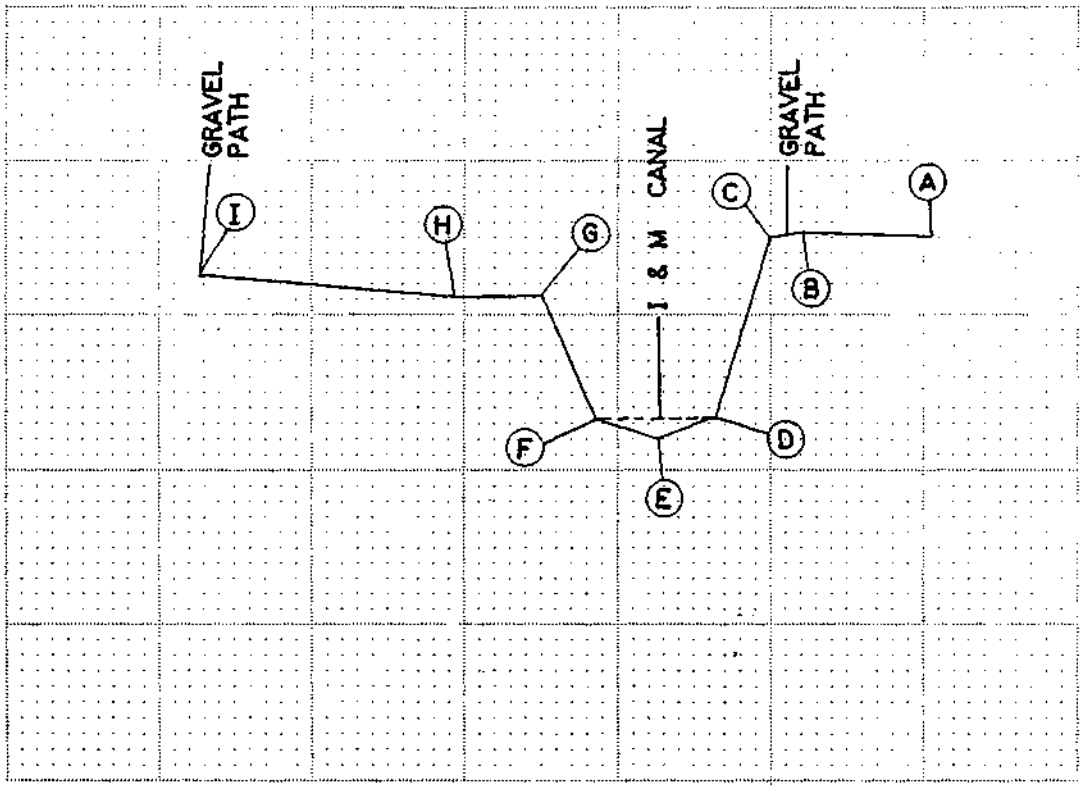
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

Fb1 P57

DATE 3-14-89

NO. 089-39-19 T

SECTION 9A



MARK	LINE STATION	ELEVATION	COORDINATES N	E
A	4+47	575.1		
B	4+89	575.3		
C	5+00	575.0	1790274.057	574069.217
D	5+19	563.3		
E	5+37	562.0		
F	5+57	563.3		
G	5+74	571.3		
H	6+03	571.2	1790319.230	573976.419
I	6+88	572.6		

SEE TIE SHEET 20 T

----- INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929

Coordinates are based on the Illinois State Plane Coordinate System East zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

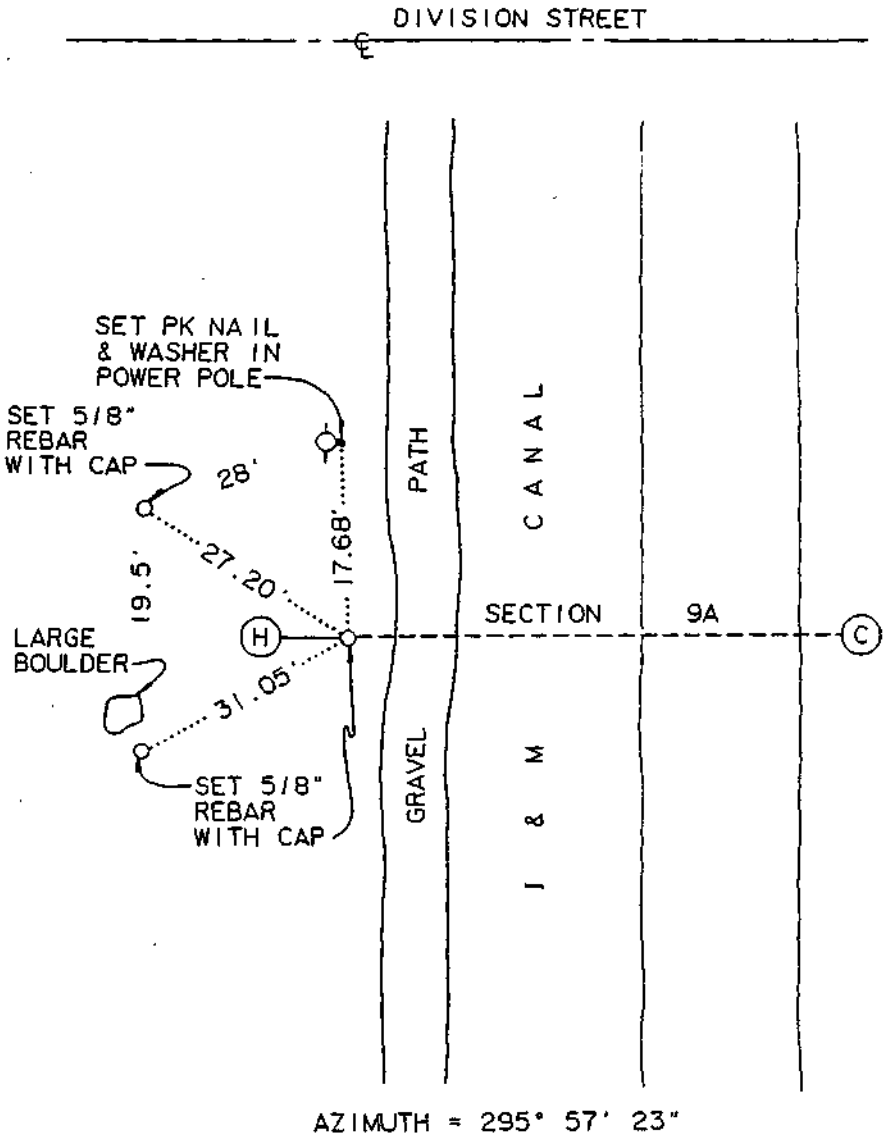
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P60

DATE 5-4-89

NO. 089-39-20

TIE DIAGRAM
SECTION 9A (WEST)



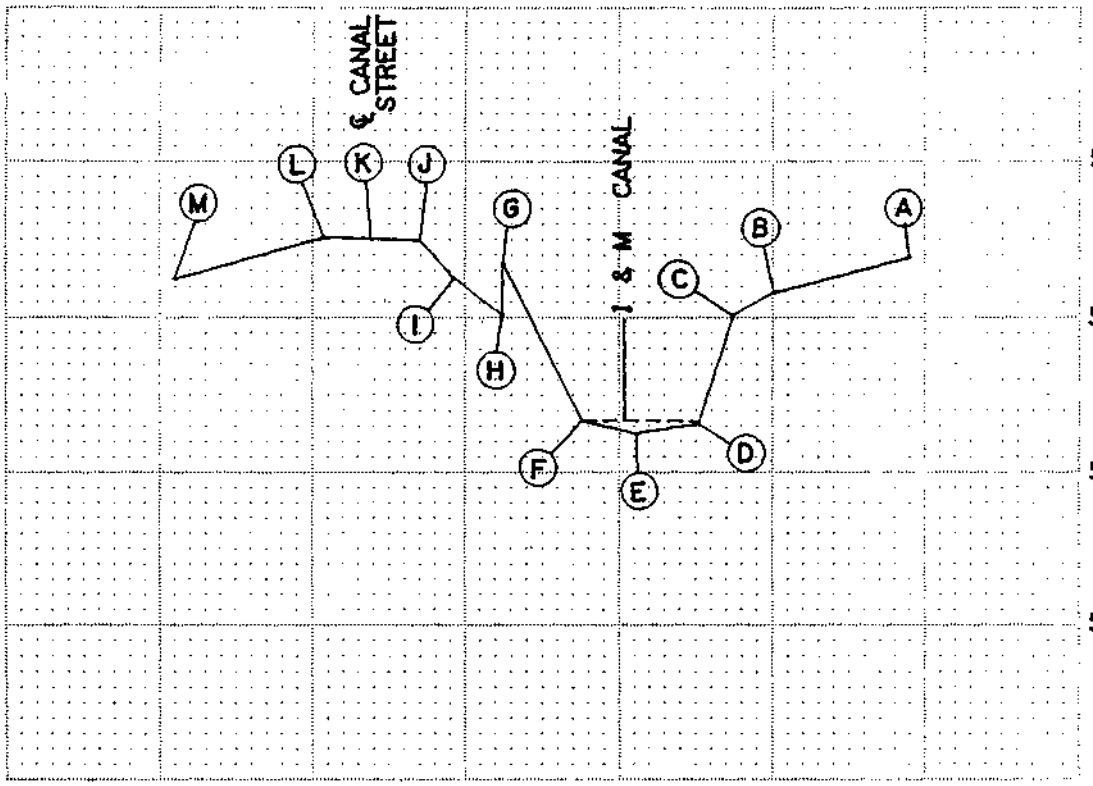
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P59

DATE 5-4-89

NO. 089-39-20 T

SECTION 9B



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+55	573.8			
B	5+00	571.5	1790533.261	574189.891	
C	5+13	570.0			
D	5+25	563.3			
E	5+44	562.4			
F	5+62	563.3			
G	5+88	573.6	1790556.880	574105.225	SEE TIE SHEET 21 T
H	5+88	571.1			
I	6+04	572.5			
J	6+16	575.0			
K	6+31	575.0			
L	6+47	575.1			
M	6+96	572.5			

National Geodetic Vertical Datum of 1929

Coordinates are based on the Illinois State Plane Coordinate System East zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----- INDICATES WATER LEVEL

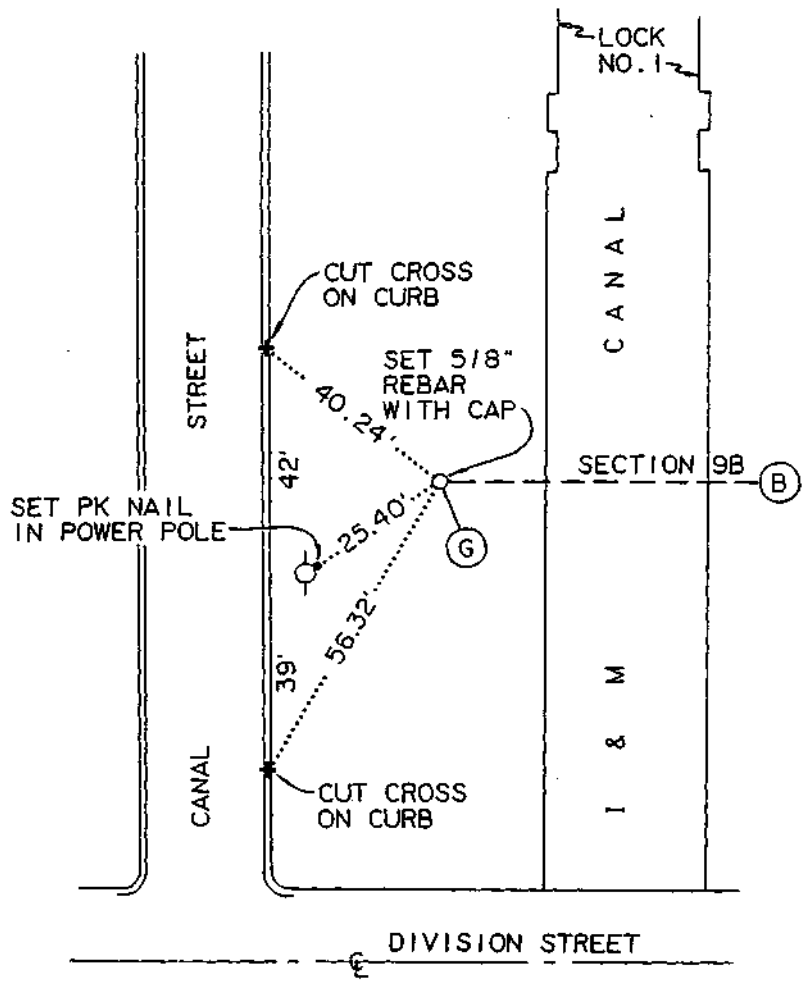
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB11 P61

DATE 5-4-89

NO. 089-39-21

TIE DIAGRAM
SECTION 9B (WEST)

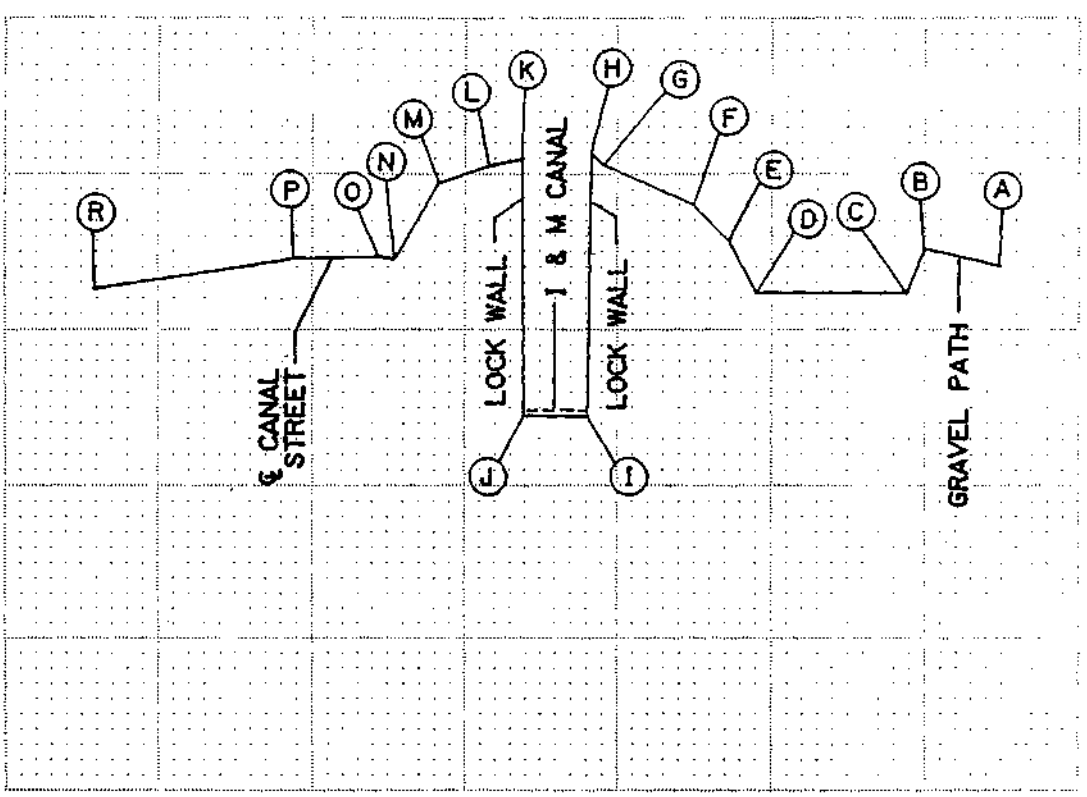


AZIMUTH = 105° 35' 13"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P59
DATE 5-4-89
NO. 089-39-21 T

SECTION 9C



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+20	574.1			
B	4+40	575.2			
C	4+45	572.3			
D	4+84	572.4			
E	4+91	575.7			
F	5+00	577.9	1790713.223	574239.584	
G	5+23	580.6			
H	5+27	581.3			
I	5+27	564.5			
J	5+44	564.5			
K	5+45	580.9			
L	5+55	580.5	1790732.960	574188.366	SEE TIE SHEET 22 T
M	5+67	579.4			
N	5+78	574.5			
O	5+82	574.7			
P	6+05	574.7			
R	6+56	572.7			

----- INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

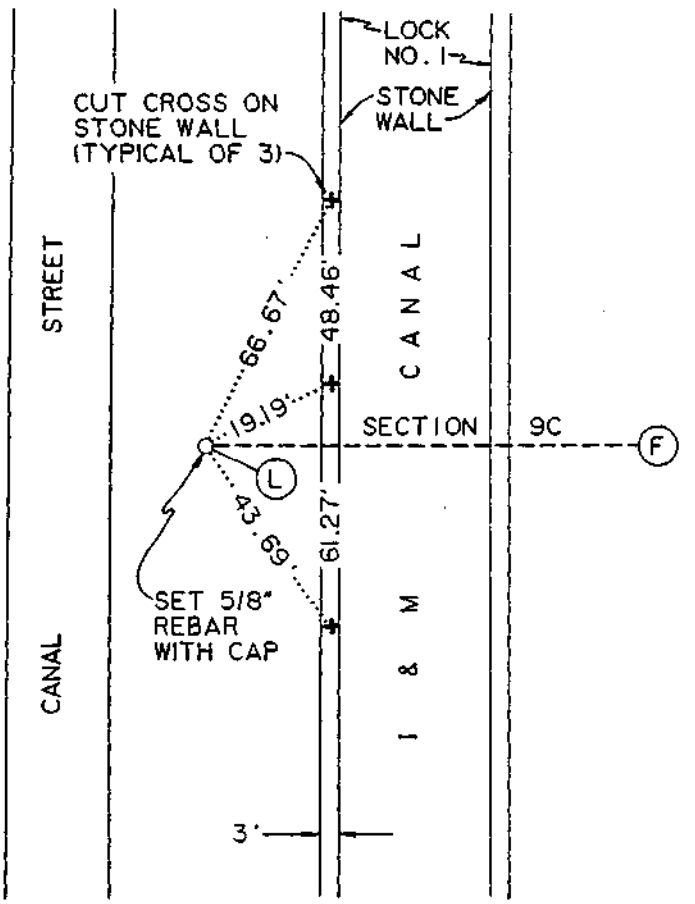
Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

DATE 5-4-89

NO. 089-39-22

TIE DIAGRAM
SECTION 9C (WEST)



AZIMUTH = 111° 04' 26"

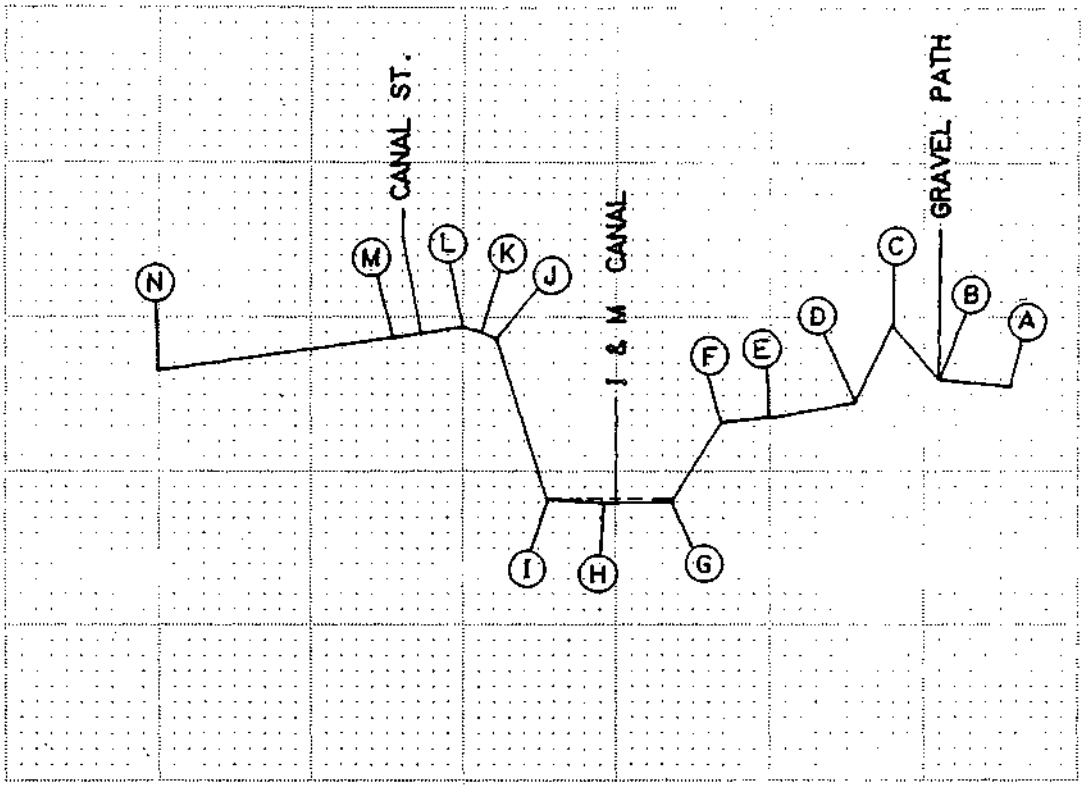
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P60

DATE 5-4-89

NO. 089-39-22 T

SECTION 9D



MARK	LINE STATION	ELEVATION	COORDINATES N	E
A	4+22	575.7		
B	4+46	576.1		
C	4+60	579.6		
D	4+72	574.6		
E	5+00	573.5	1790948.413	574344.287
F	5+16	573.2		
G	5+33	568.0		
H	5+54	567.9		
I	5+72	568.2		
J	5+89	578.5		
K	5+94	578.9	1790977.210	574254.569
L	6+00	579.3		
M	6+24	578.7		
N	7+00	576.5		

SEE TIE SHEET 23 T

----- INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

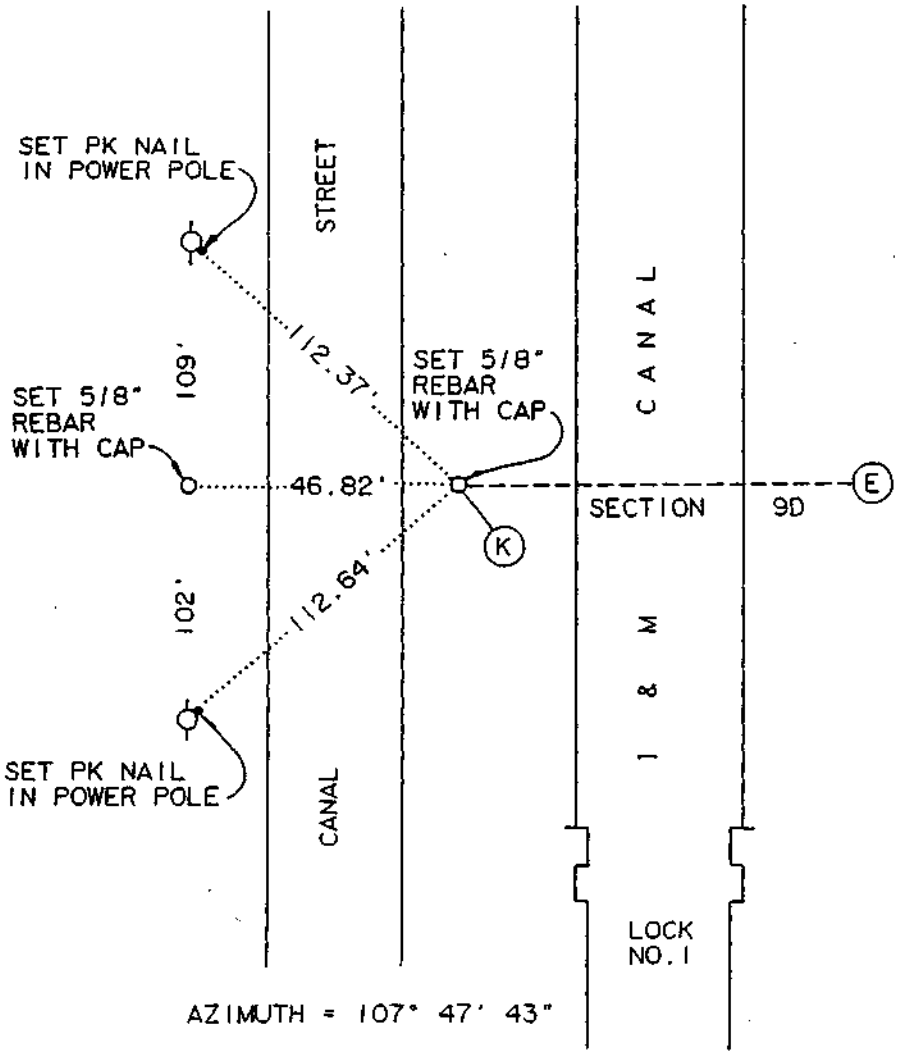
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P63

DATE 5-4-89

NO. 089-39-23

TIE DIAGRAM
SECTION 9D (WEST)



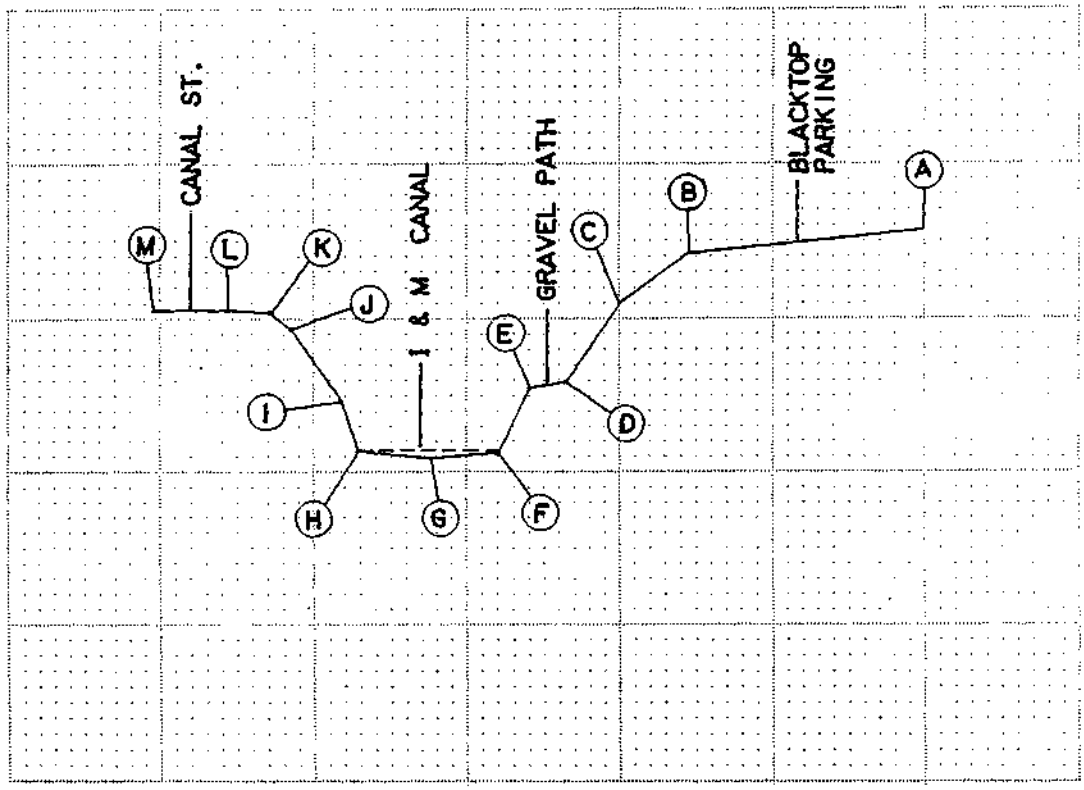
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P60

DATE 5-4-89

NO. 089-39-23 T

SECTION 10A



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+00.	585.7			
B	4+77	584.2			
C	5+00	580.9	1792966.840	575074.611	SEE TIE SHEET 24 T
D	5+18	575.9			
E	5+30	575.4			
F	5+40	571.1			
G	5+62	570.8			
H	5+86	571.3			
I	5+91	574.7			
J	6+08	579.3			
K	6+15	580.3	1793008.016	574966.864	
L	6+20	580.5			
M	6+52	580.4			

----- INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

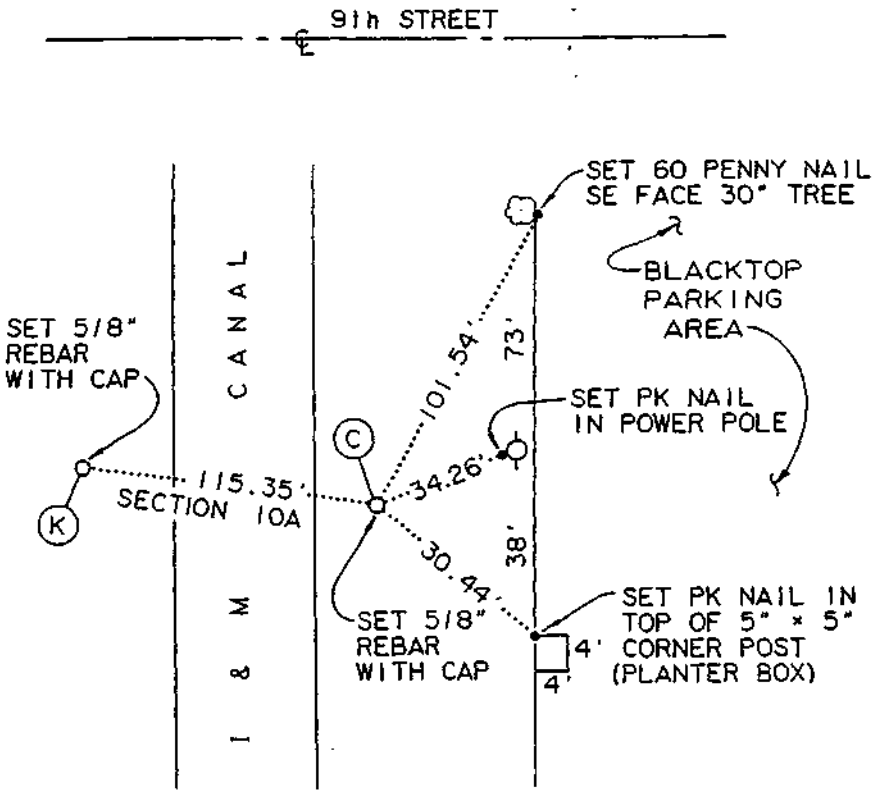
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P64

DATE 5-4-89

NO. 089-39-24

TIE DIAGRAM
SECTION 10A (EAST)

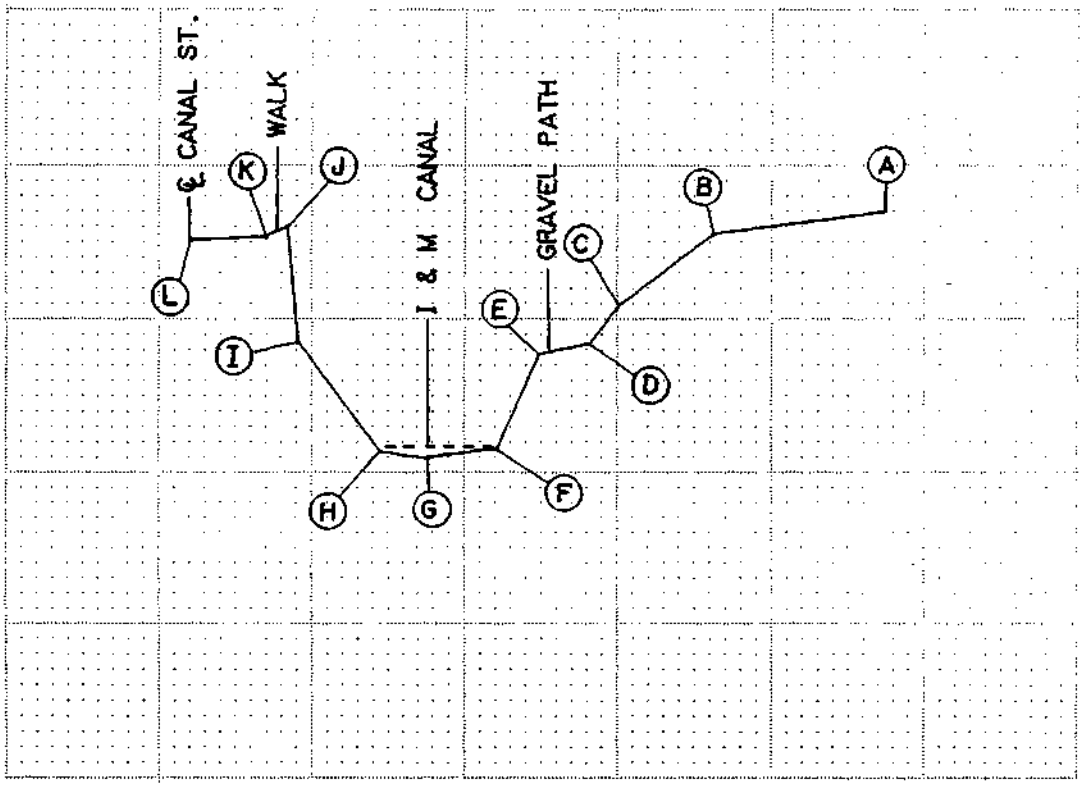


AZIMUTH = 110° 54' 52"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P61
DATE 5-4-89
NO. 089-39-24 T

SECTION 10B



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+13	587.1			
B	4+69	585.5			
C	5+00	580.8	1793191.510	575146.368	SEE TIE SHEET 25 T
D	5+08	578.3			
E	5+27	577.8			
F	5+39	571.6			
G	5+61	570.9			
H	5+79	571.3			
I	6+04	578.5	1793227.990	575048.609	
J	6+09	586.0			
K	6+16	585.3			
L	6+40	585.2			

X-SECTION NORTH OF ℄ 9th STREET

----INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

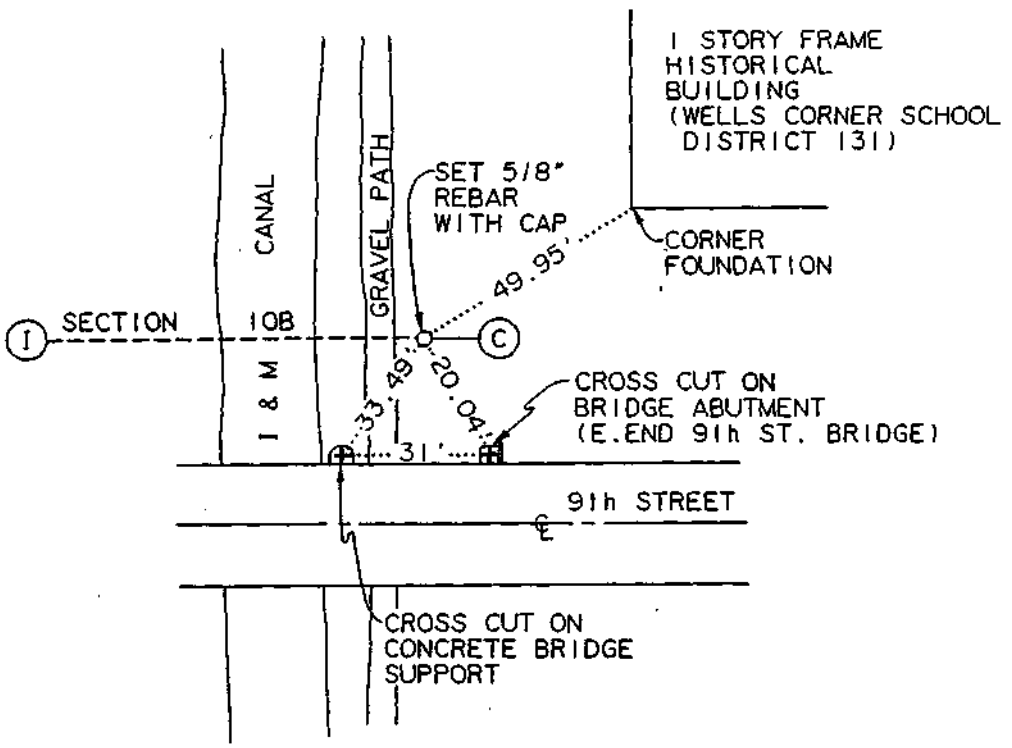
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB11 P65

DATE 5-4-89

NO. 089-39-25

TIE DIAGRAM
SECTION 10B (EAST)

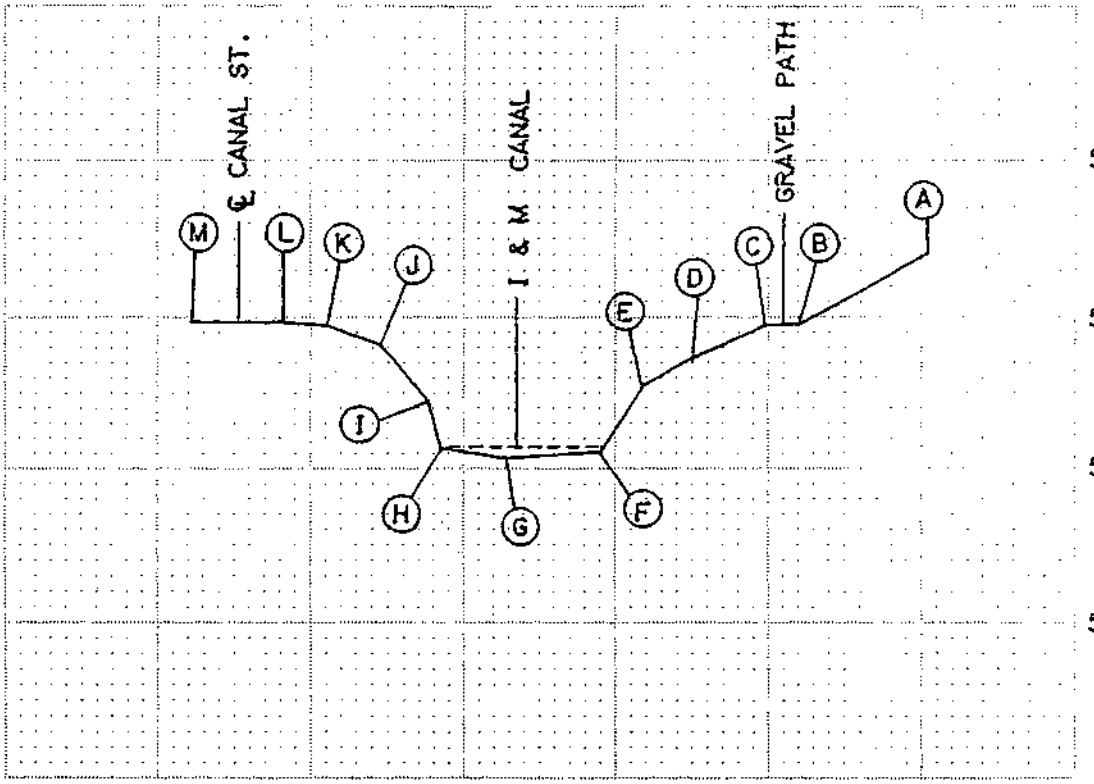


AZIMUTH = 110° 27' 49"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P61
DATE 5-4-89
NO. 089-39-25 T

SECTION 10C



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+38	584.1			
B	4+72	579.6			
C	4+80	579.6			
D	5+00	577.3	1793355.840	575187.460	SEE TIE SHEET 26 T
E	5+13	575.6			
F	5+24	571.7			
G	5+49	570.8			
H	5+66	571.2			
I	5+69	574.5			
J	5+82	578.2	1793385.222	575111.114	
K	5+96	579.4			
L	6+07	579.8			
M	6+31	579.7			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

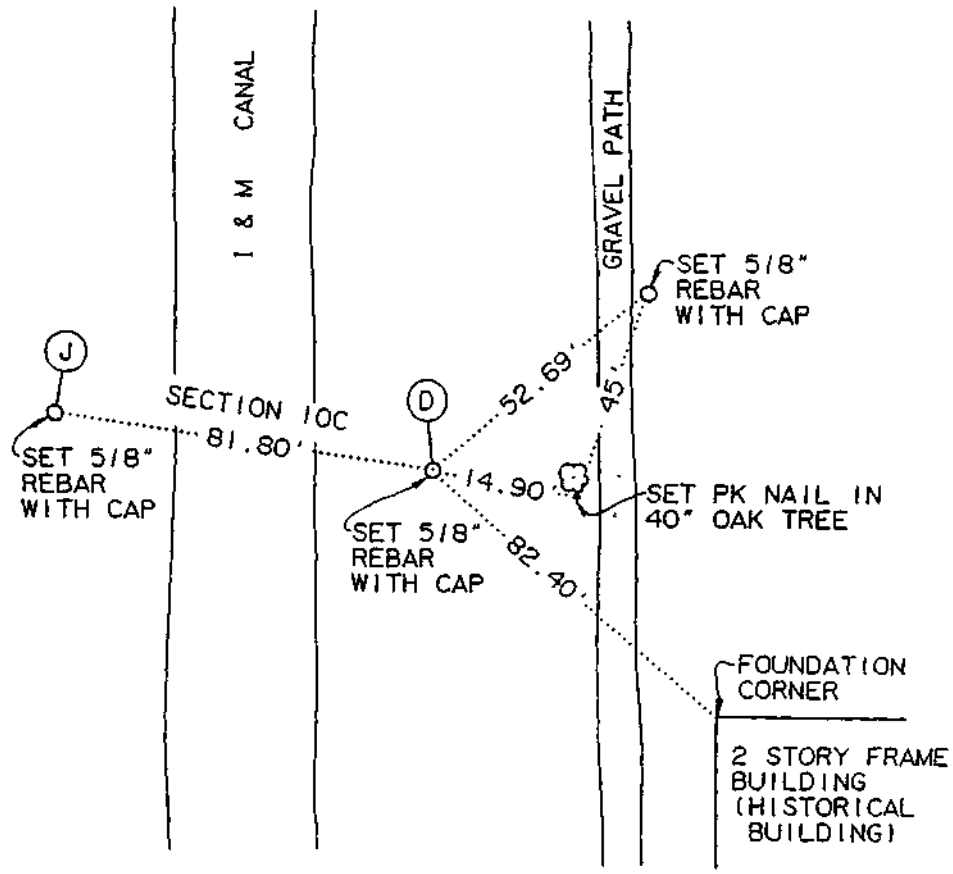
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB11 P66

DATE 5-4-89

NO. 089-39-26

TIE DIAGRAM
SECTION 10C (EAST)

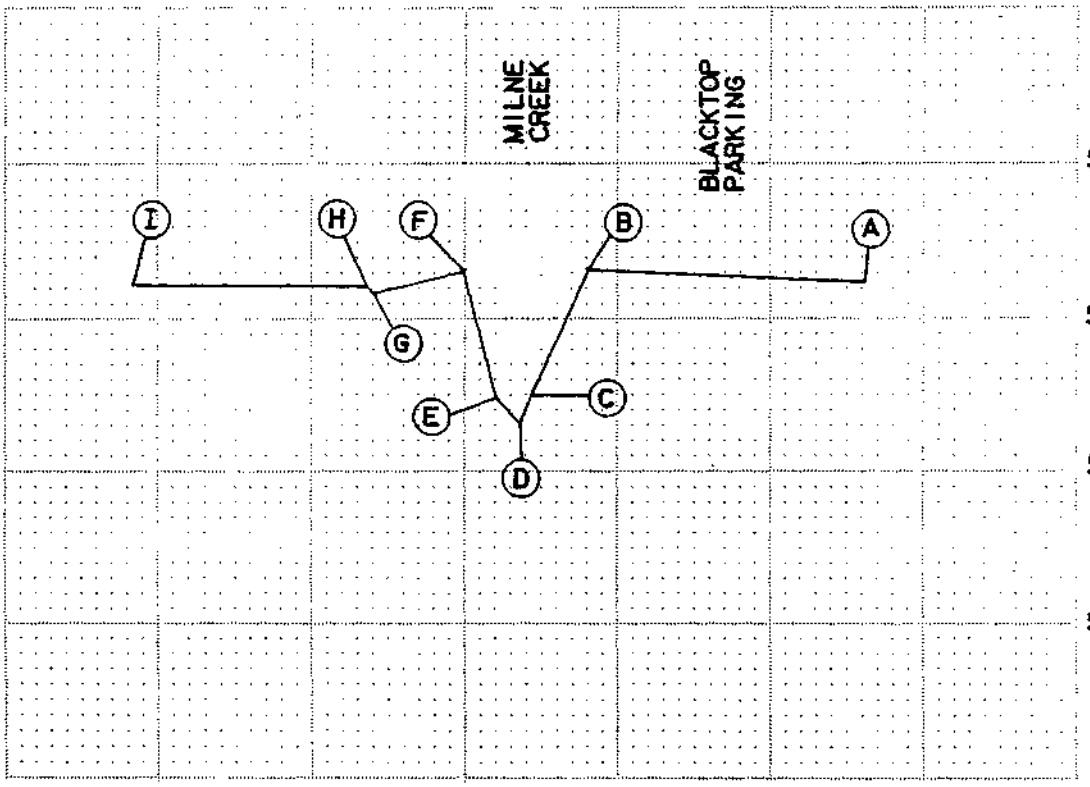


AZIMUTH = 111° 02' 58"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P62
DATE 5-4-89
NO. 089-39-26 T

SECTION 11A



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+19	582.6			
B	5+10	583.2			
C	5+29	575.0			
D	5+32	573.0			
E	5+39	574.9			
F	5+51	583.0	1793655.703	575324.324	SEE TIE SHEET 27 T
G	5+80	581.7			
H	5+82	582.1			
I	6+59	582.2			

----- INDICATES WATER LEVEL.

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

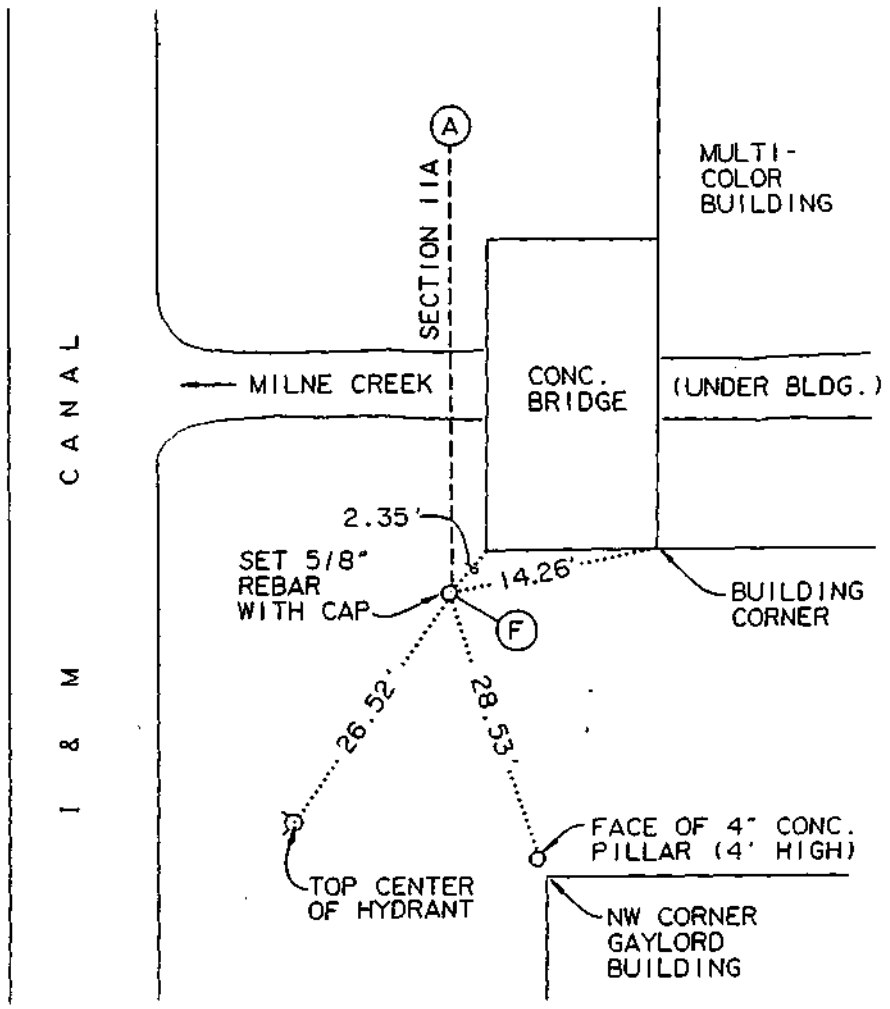
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB11 P68

DATE 5-5-89

NO. 089-39-27

TIE DIAGRAM
SECTION 11A (SOUTH)



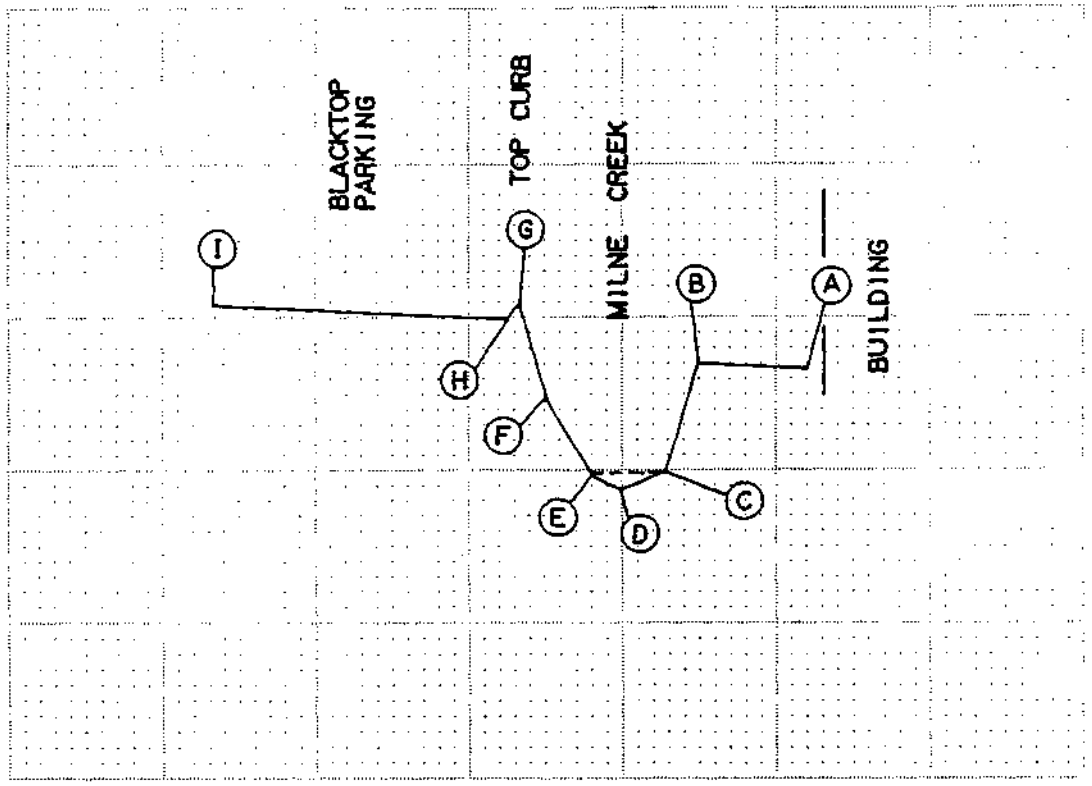
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P62

DATE 5-5-89

NO. 089-39-27 T

SECTION IIB



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+76	586.7			
B	5+00	587.0	1793597.309	575513.562	
C	5+09	579.9			
D	5+20	578.6			
E	5+27	579.7			
F	5+39	584.8			
G	5+46	590.9			
H	5+50	589.9	1793551.740	575497.775	SEE TIE SHEET 28 T
I	6+27	590.9			

----- INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

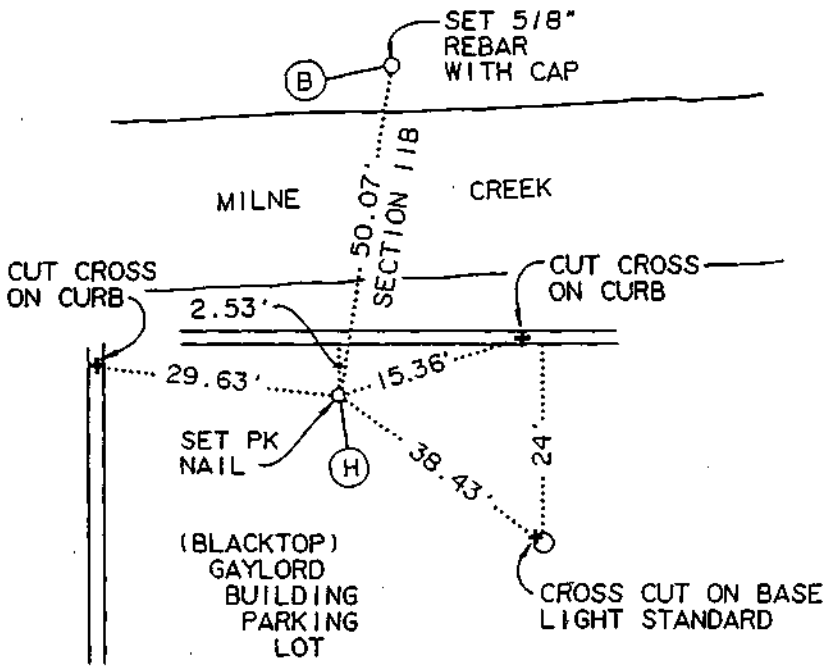
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P67

DATE 5-4-89

NO. 089-39-28

TIE DIAGRAM
SECTION 11B (SOUTH)



AZIMUTH = 24° 31' 15"

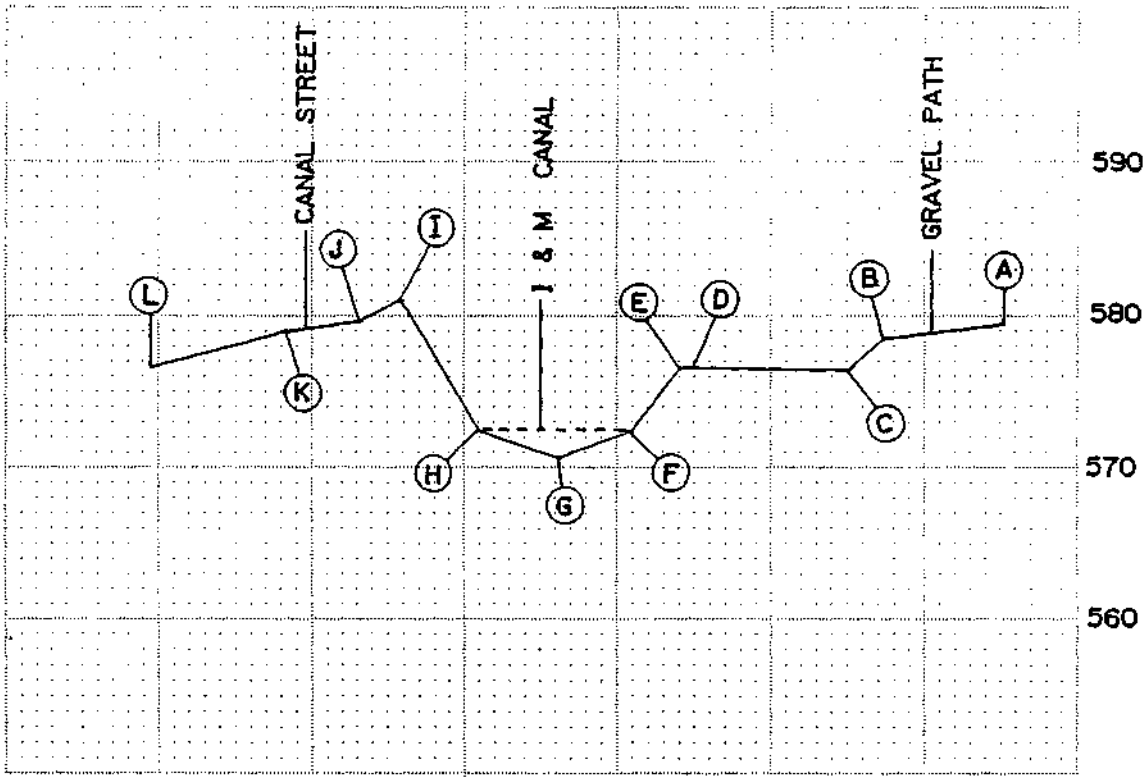
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P63

DATE 5-4-89

NO. 089-39-28 T

SECTION I2A



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+19	579.5			
B	4+50	578.5			
C	4+60	576.4			
D	5+00	576.6	1795057.333	575767.775	
E	5+04	576.4			
F	5+18	572.2			
G	5+35	570.6			
H	5+56	572.3			
I	5+77	581.1	1795070.220	575691.557	SEE TIE SHEET 29 T
J	5+87	579.7			
K	6+07	579.0			
L	6+42	576.5			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

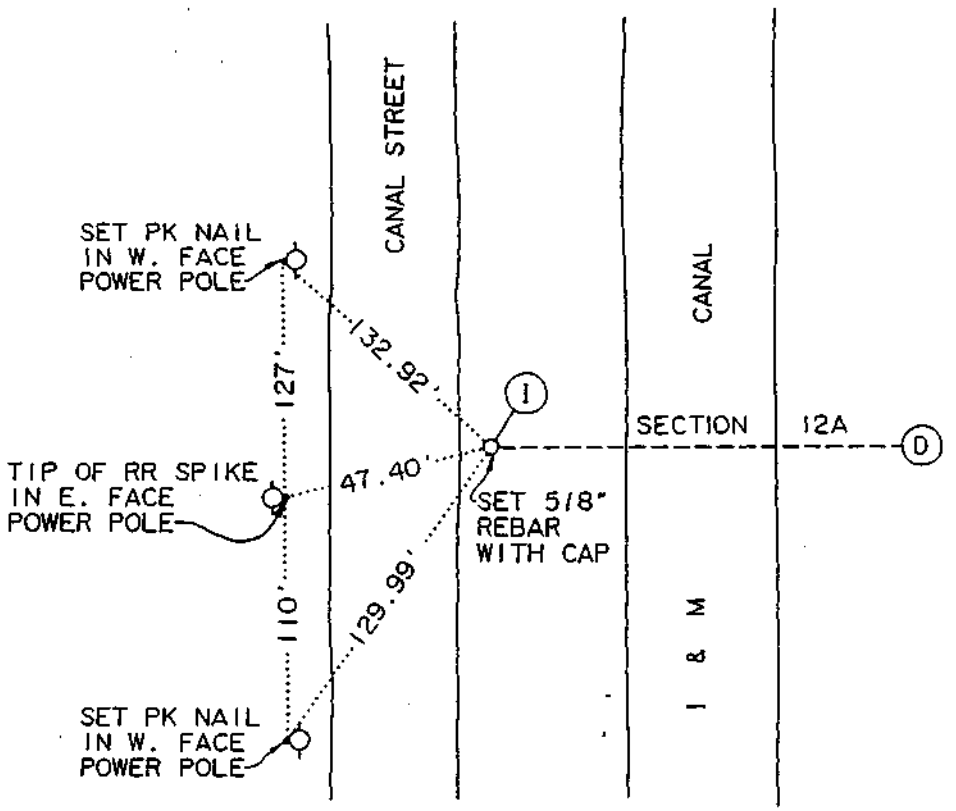
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P68.5

DATE 5-5-89

NO. 089-39-29

TIE DIAGRAM
SECTION 12A (WEST)

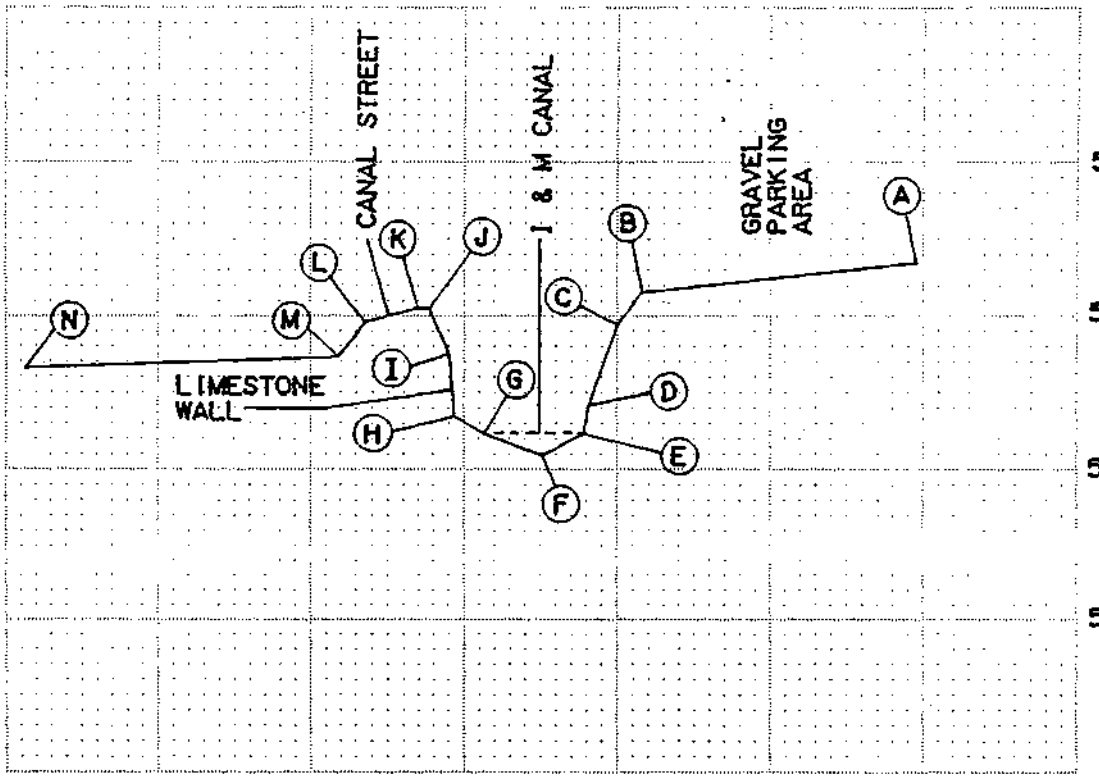


AZIMUTH = 99° 35' 49"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P63
DATE 5-4-89
NO. 089-39-29 T

SECTION 13A



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	3+93	583.4			
B	5+00	581.6	1795871.623	575799.182	
C	5+09	579.5			
D	5+21	574.3			
E	5+24	572.2			
F	5+39	570.9			
G	5+63	572.3			
H	5+74	573.4			
I	5+76	577.5			
J	5+84	580.4	1795865.080	575715.801	SEE TIE SHEET 30 T
K	5+89	580.4			
L	6+08	579.7			
M	6+19	577.1			
N	7+43	576.5			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

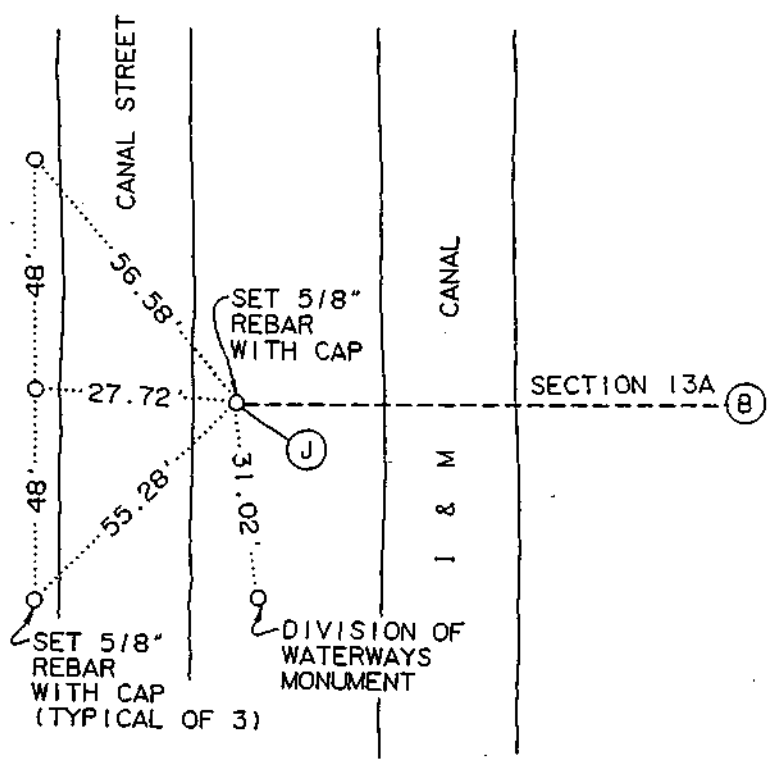
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P69

DATE 5-5-89

NO. 089-39-30

TIE DIAGRAM
SECTION 13A (WEST)



AZIMUTH = 85° 30' 47"

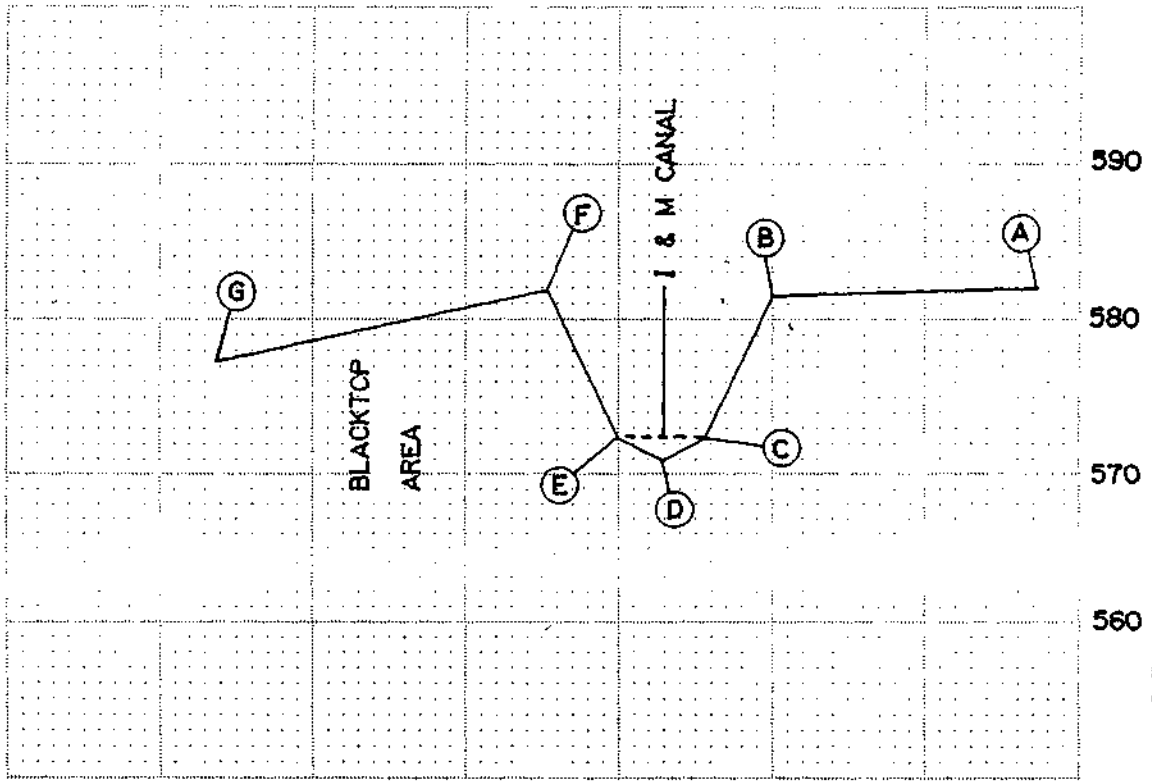
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P64

DATE 5-5-89

NO. 089-39-30 T

SECTION 13B



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+14	582.0			
B	5+00	581.4	1796081.796	575746.986	
C	5+23	572.4			
D	5+37	570.9			
E	5+50	572.2			
F	5+74	581.8	1796072.220	575673.970	SEE TIE SHEET 31 T
G	6+83	577.2			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

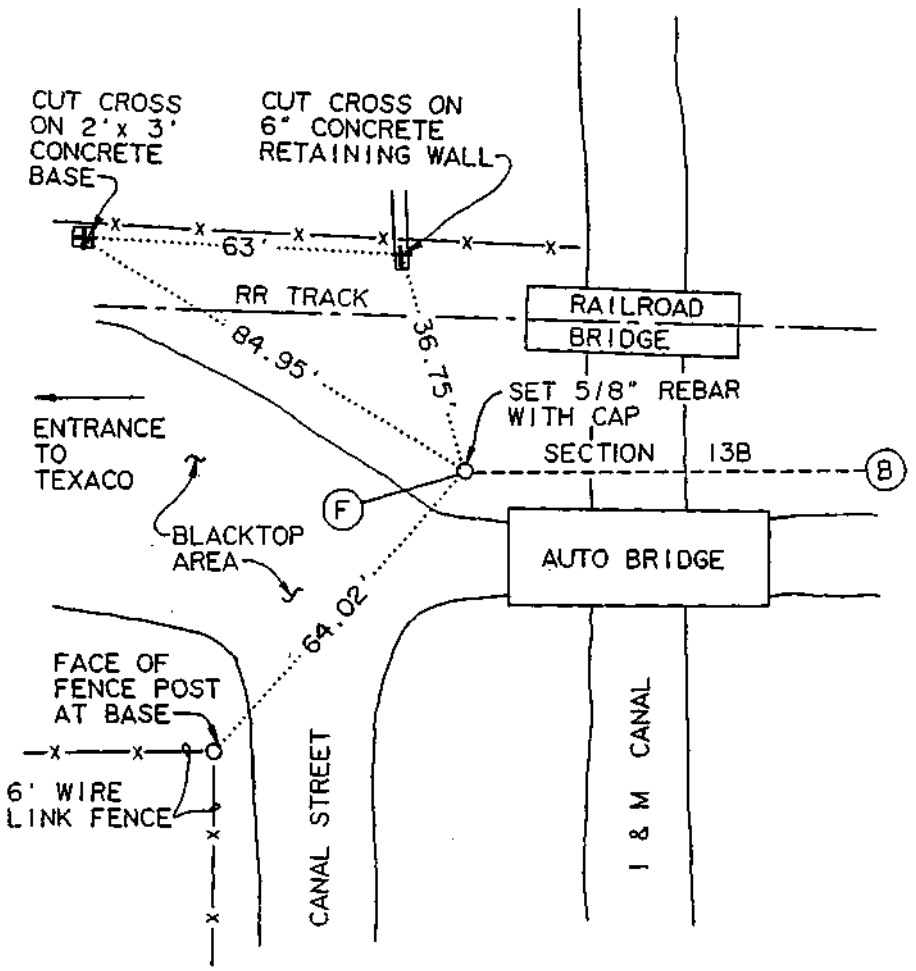
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB11 P70

DATE 5-5-89

NO. 089-39-31

TIE DIAGRAM
SECTION 13B (WEST)

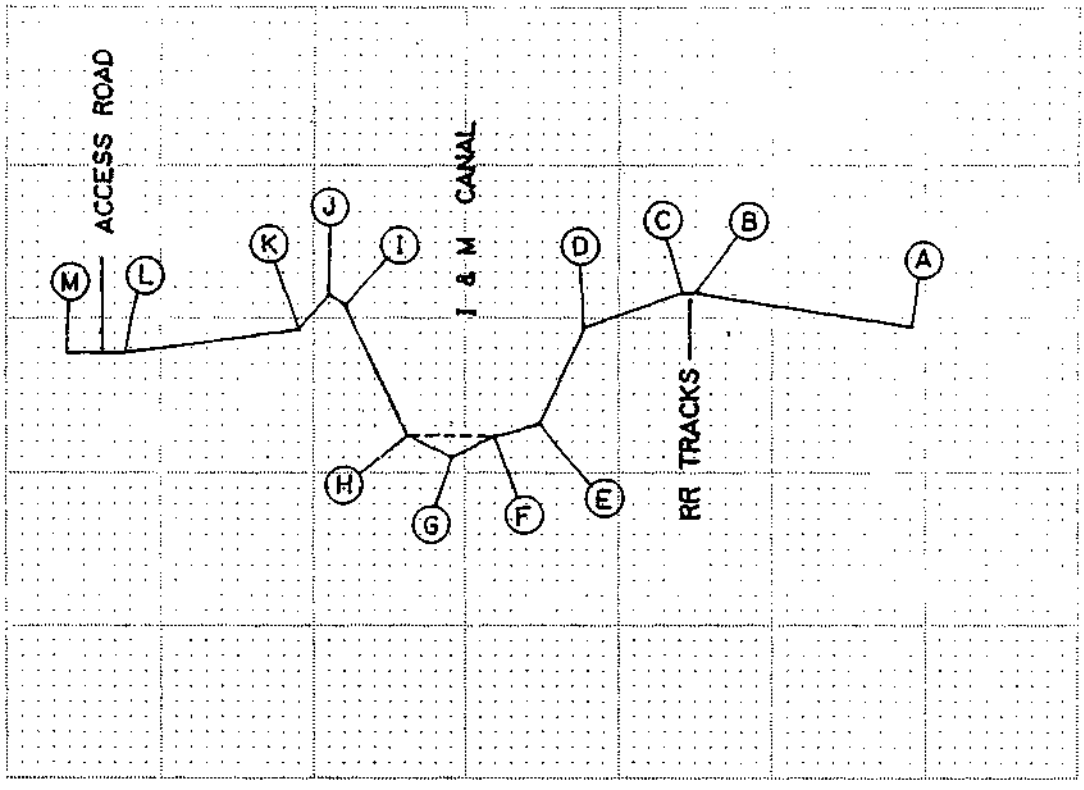


AZIMUTH = 82° 31' 43"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB1 P64
DATE 5-5-89
NO. 089-39-31 T

SECTION 13C



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	3+94	579.3			
B	4+63	581.7			
C	4+68	581.8			
D	5+00	579.2	1796261.051	575691.165	
E	5+16	573.1			
F	5+29	572.3			
G	5+44	571.0			
H	5+61	572.4			
I	5+79	581.0			
J	5+84	581.5	1796232.730	575611.949	SEE TIE SHEET 32 T
K	5+93	579.2			
L	6+51	577.8			
M	6+70	577.9			

----- INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidl & Associates for the U.S. Corps of Engineers.

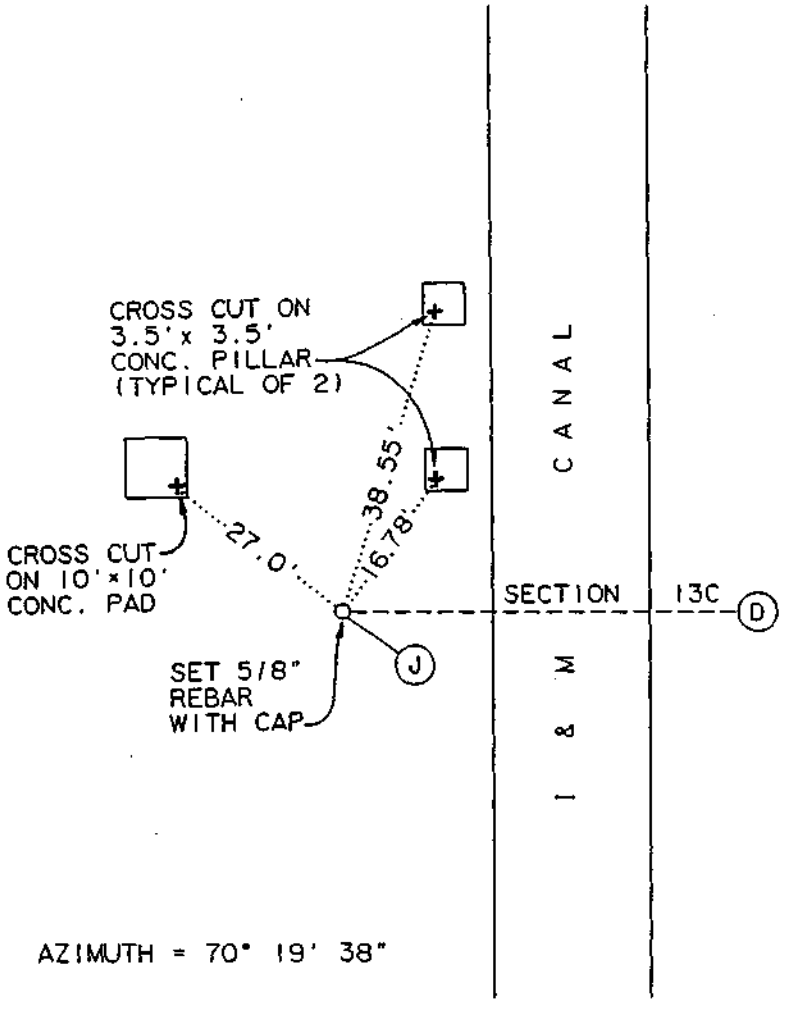
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB II P71

DATE 5-5-89

NO. 089-39-32

TIE DIAGRAM
SECTION 13C (WEST)



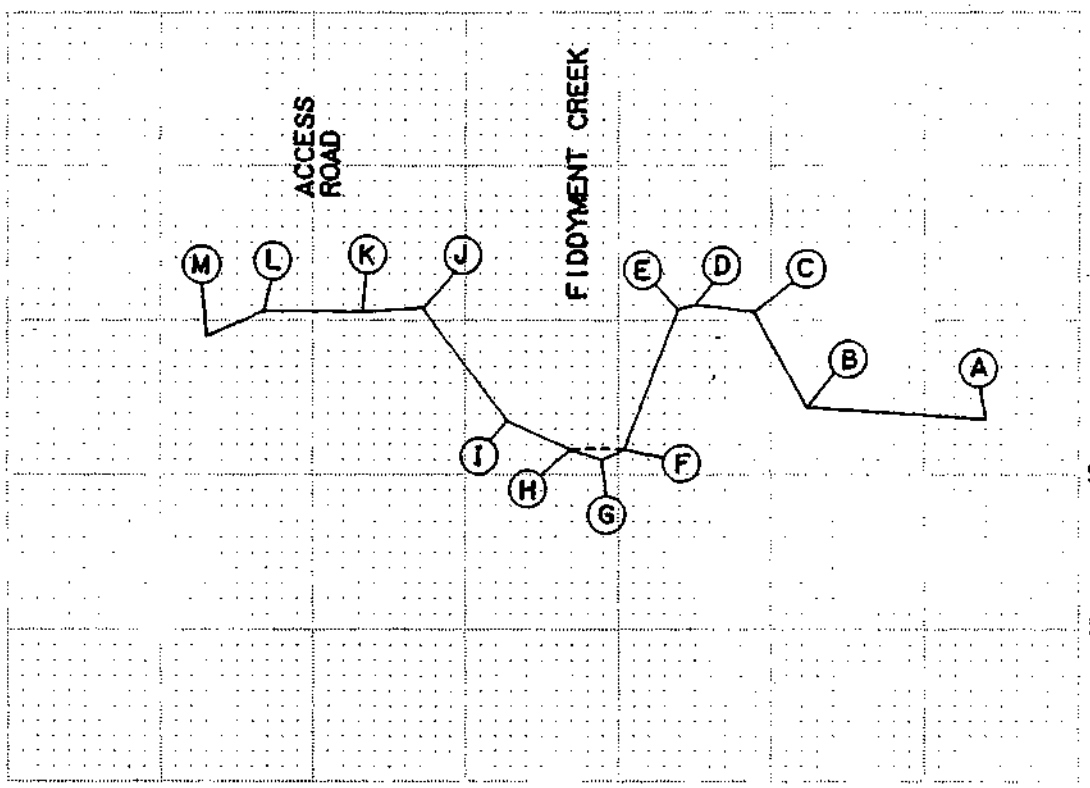
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P65

DATE 5-5-89

NO. 089-39-32 T

SECTION 16A



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+24	583.7			
B	4+71	584.4			
C	4+85	590.4			
D	5+00	591.0	1797157.840	576458.183	SEE TIE SHEET 33 T
E	5+05	590.6			
F	5+19	581.7			
G	5+24	581.0			
H	5+32	581.7			
I	5+49	583.5			
J	5+71	590.8	1797118.511	576517.518	
K	5+88	590.4			
L	6+13	590.4			
M	6+28	589.0			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----- INDICATES WATER LEVEL

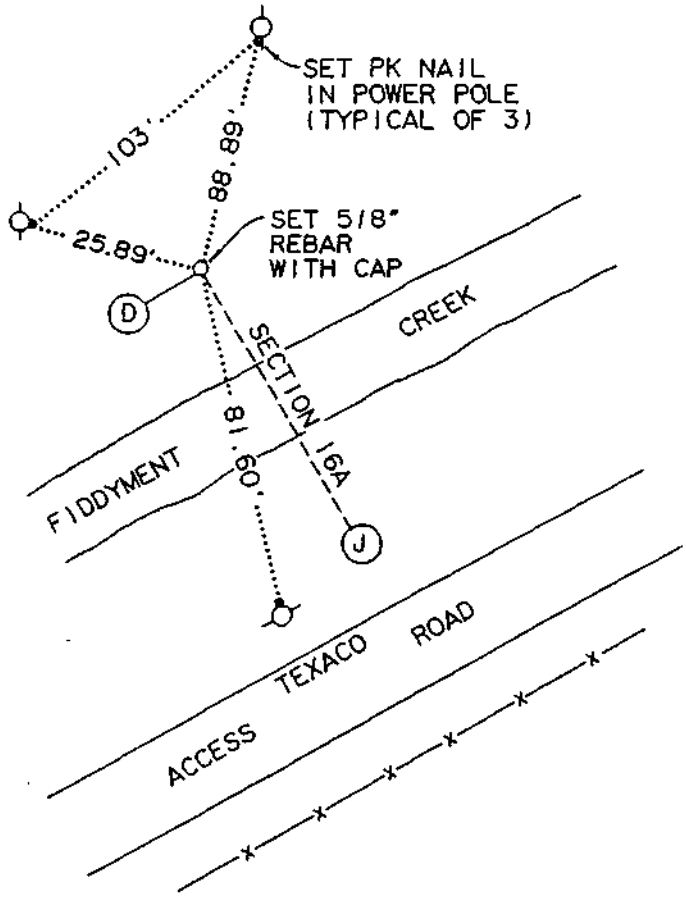
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P9

DATE 5-9-89

NO. 089-39-33

TIE DIAGRAM
SECTION 16A (NORTH)



AZIMUTH = 123° 32' 14"

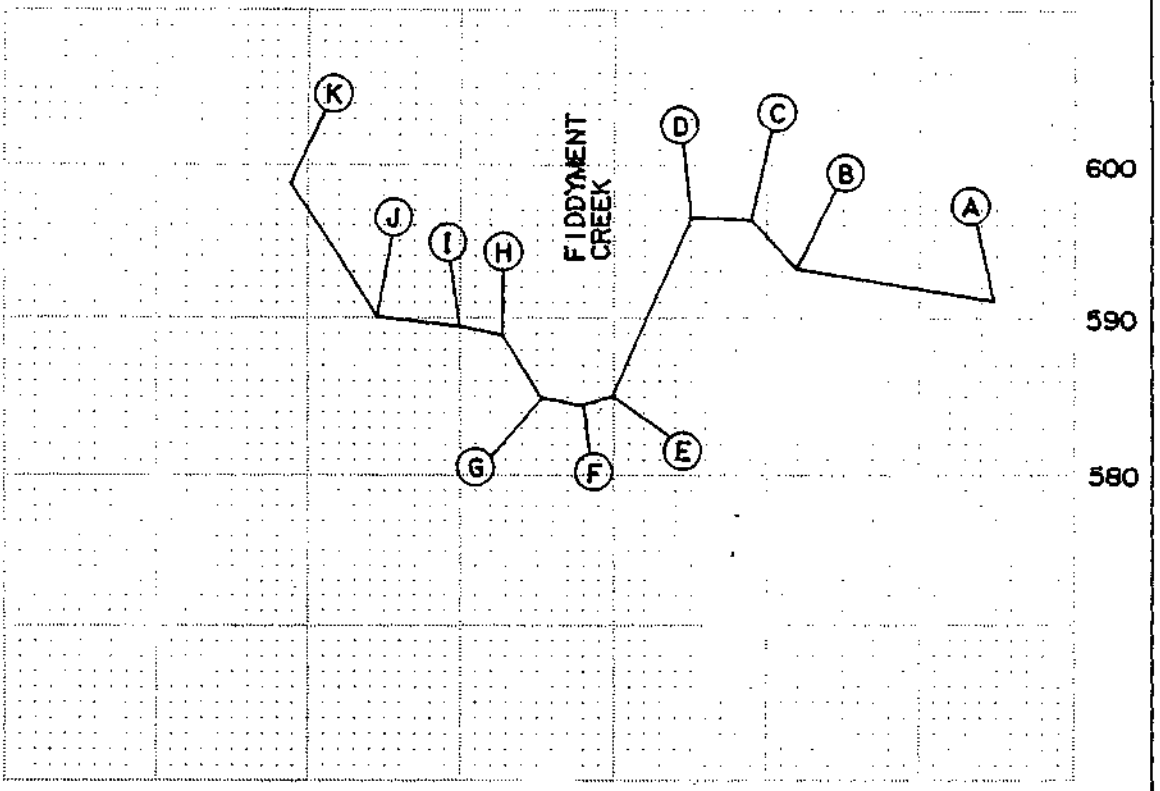
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P8

DATE 5-9-89

NO. 089-39-33 T

SECTION 16B



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+21	591.0			
B	4+73	593.2			
C	4+84	596.3			
D	5+00	596.4	1797218.450	576793.726	SEE TIE SHEET 34 T
E	5+20	585.1			
F	5+28	584.3			
G	5+39	585.0			
H	5+49	588.9			
I	5+60	589.4	1797158.460	576792.365	
J	5+82	590.1			
K	6+04	598.7			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

---- INDICATES WATER LEVEL

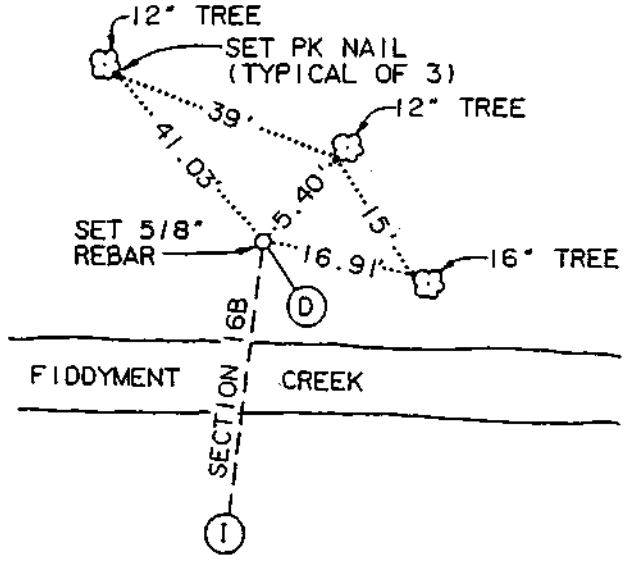
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P75

DATE 5-8-89

NO. 089-39-34

TIE DIAGRAM
SECTION 16B (NORTH)

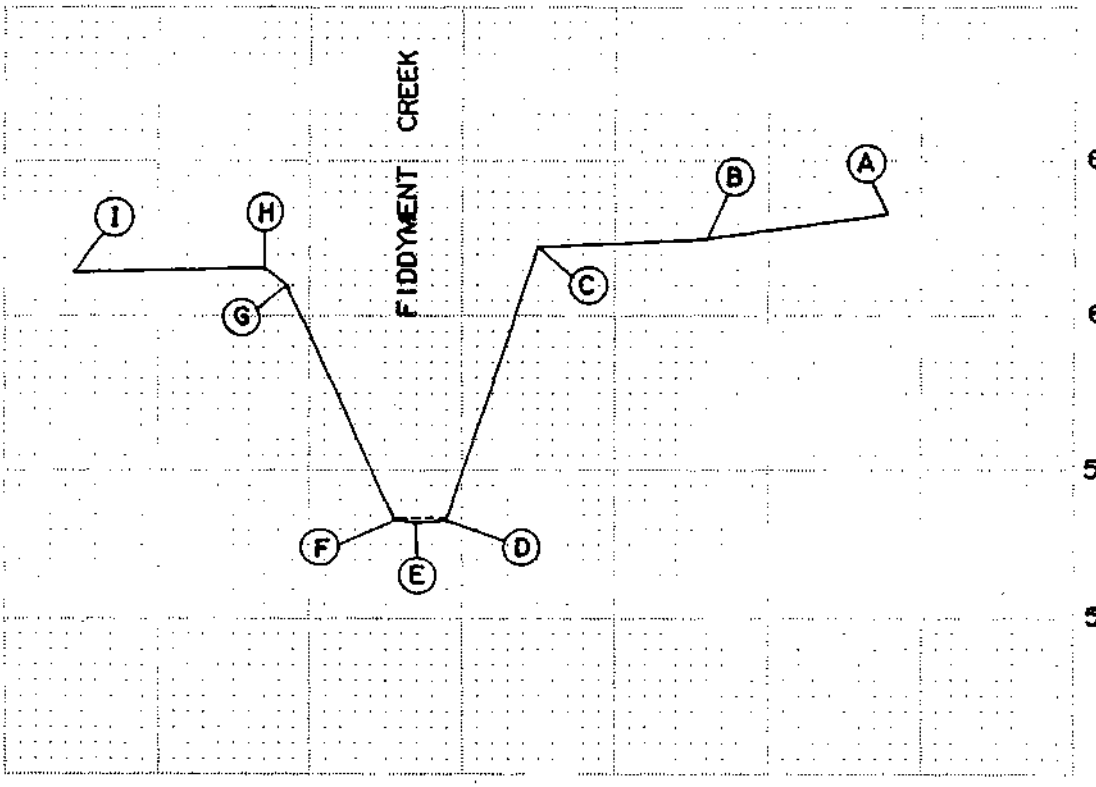


AZIMUTH = 01° 17' 59"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P67
DATE 5-5-89
NO. 089-39-34 T

SECTION 16C



MARK	LINE STATION	ELEVATION	COORDINATES N	E
A	3+86	606.4		
B	4+45	605.0		
C	5+00	604.5	1797227.770	577002.451
D	5+31	586.6		
E	5+41	586.3		
F	5+48	586.6		
G	5+82	602.0		
H	5+90	603.1	1797142.970	576973.756
I	6+52	602.8		

SEE TIE SHEET 35 T

----- INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

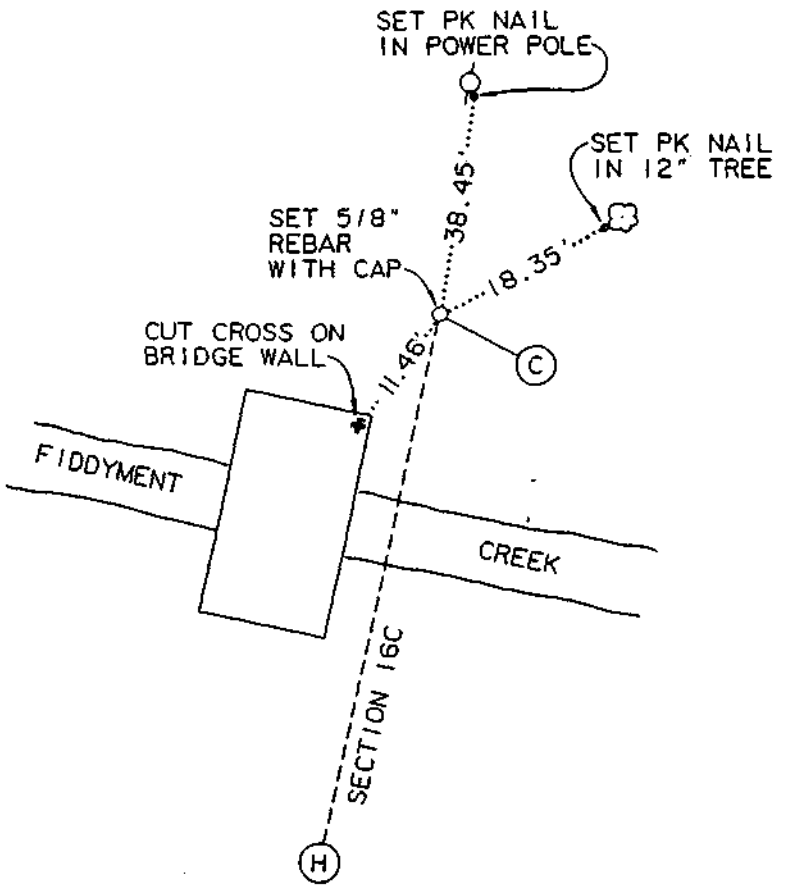
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P76

DATE 5-8-89

NO. 089-39-35

TIE DIAGRAM
SECTION 16C (NORTH)



AZIMUTH = 18° 41' 42"

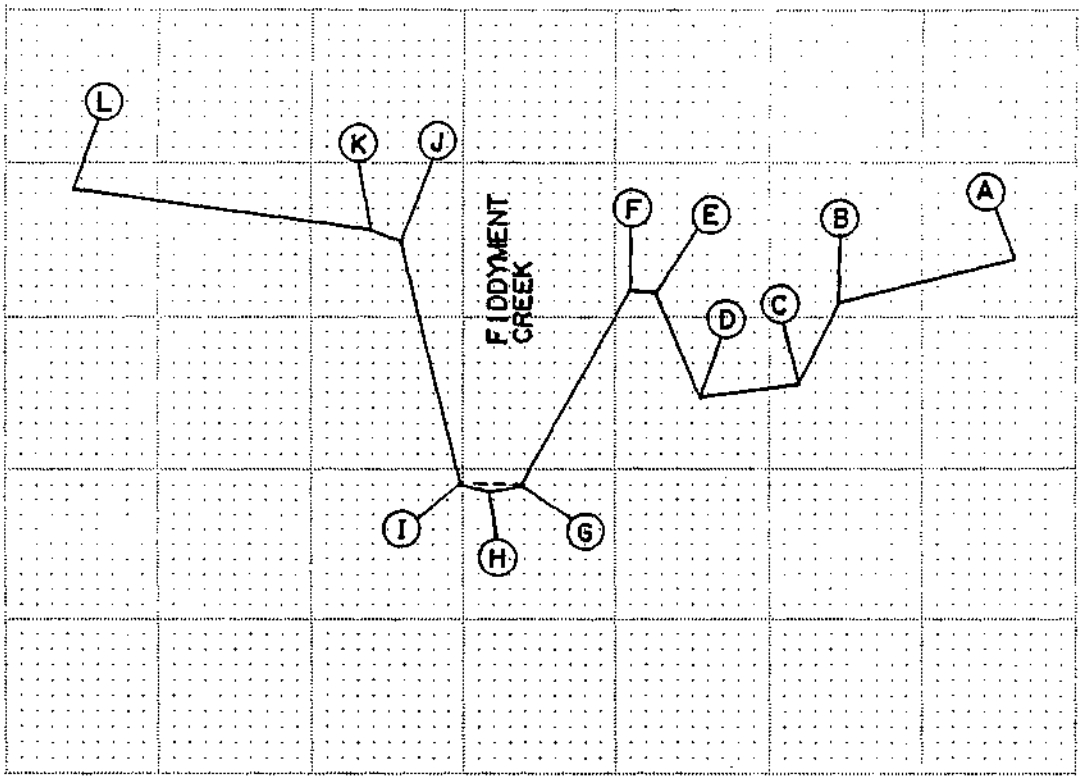
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P67

DATE 5-5-89

NO. 089-39-35 T

SECTION 16D



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	3+75	603.7			
B	4+32	601.0			
C	4+45	595.7			
D	4+77	594.7			
E	4+92	601.6			
F	5+00	601.7	1797228.420	577140.003	
G	5+36	589.0			
H	5+47	588.5			
I	5+56	589.0			
J	5+76	594.8			
K	5+86	595.5	1797143.430	577126.247	SEE TIE SHEET 36 T
L	6+83	598.2			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

---- INDICATES WATER LEVEL

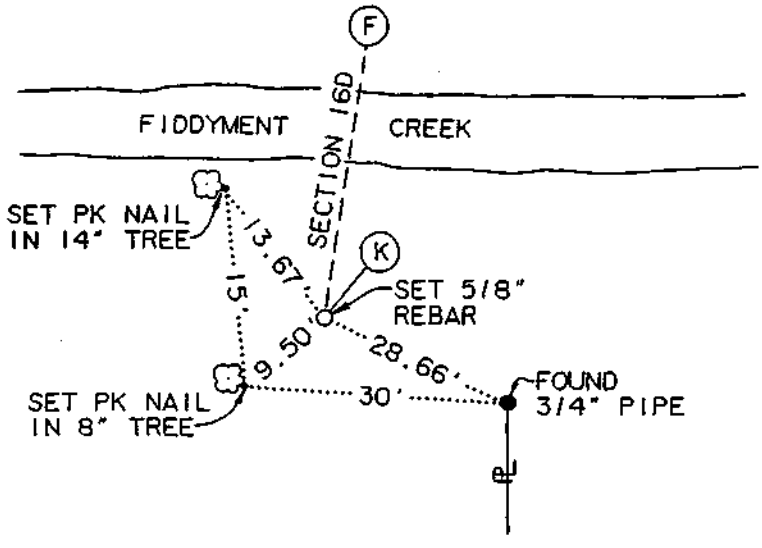
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P77

DATE 5-8-89

NO. 089-39-36

TIE DIAGRAM
SECTION 16D (SOUTH)



AZIMUTH = 09° 11' 38"

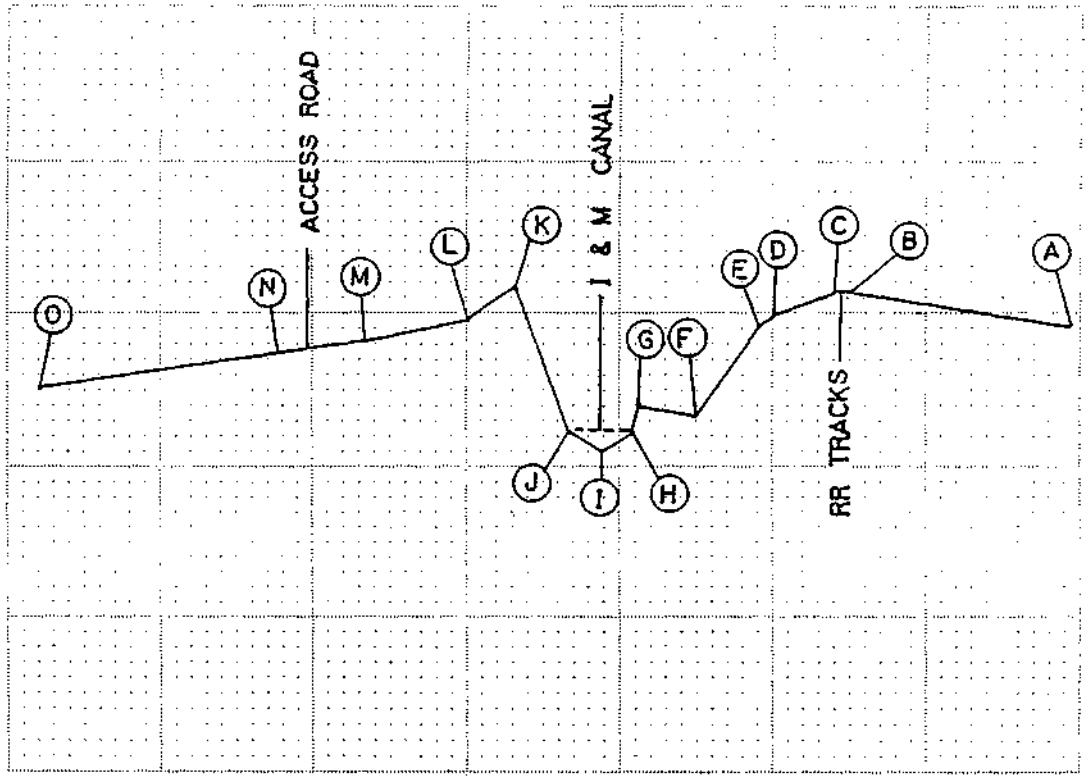
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P67

DATE 5-5-89

NO. 089-39-36 T

SECTION 14A



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+01	579.1			
B	4+76	581.6			
C	4+81	581.6			
D	5+00	579.8	1796576.826	575584.189	
E	5+05	579.2			
F	5+26	573.4			
G	5+44	574.0			
H	5+46	572.3			
I	5+57	571.0			
J	5+67	572.2			
K	5+85	581.7			
L	5+99	579.5	1796544.830	575490.488	SEE TIE SHEET 37 T
M	6+33	578.1			
N	6+63	577.4			
O	7+41	575.0			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidl & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

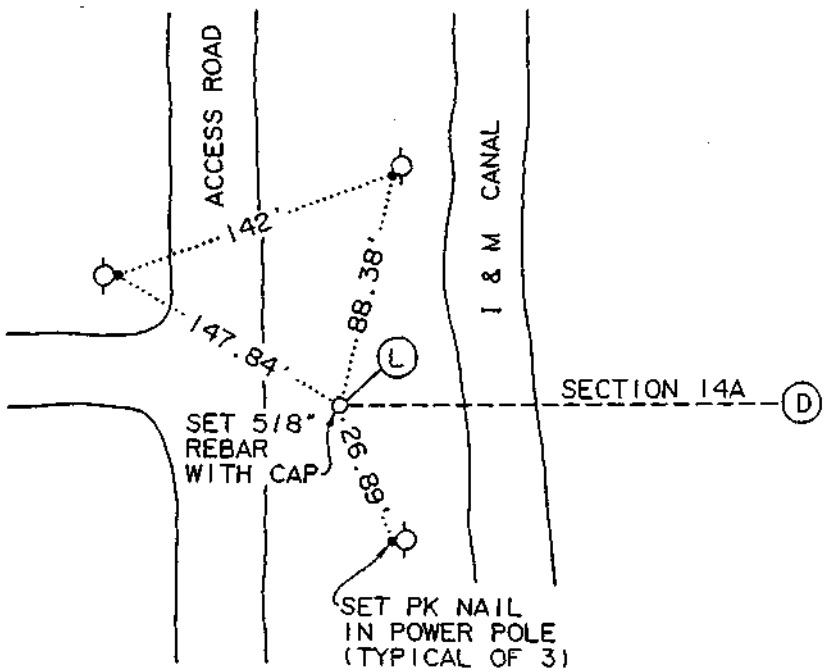
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P72

DATE 5-5-89

NO. 089-39-37

TIE DIAGRAM
SECTION 14A (WEST)



AZIMUTH = 71° 08' 48"

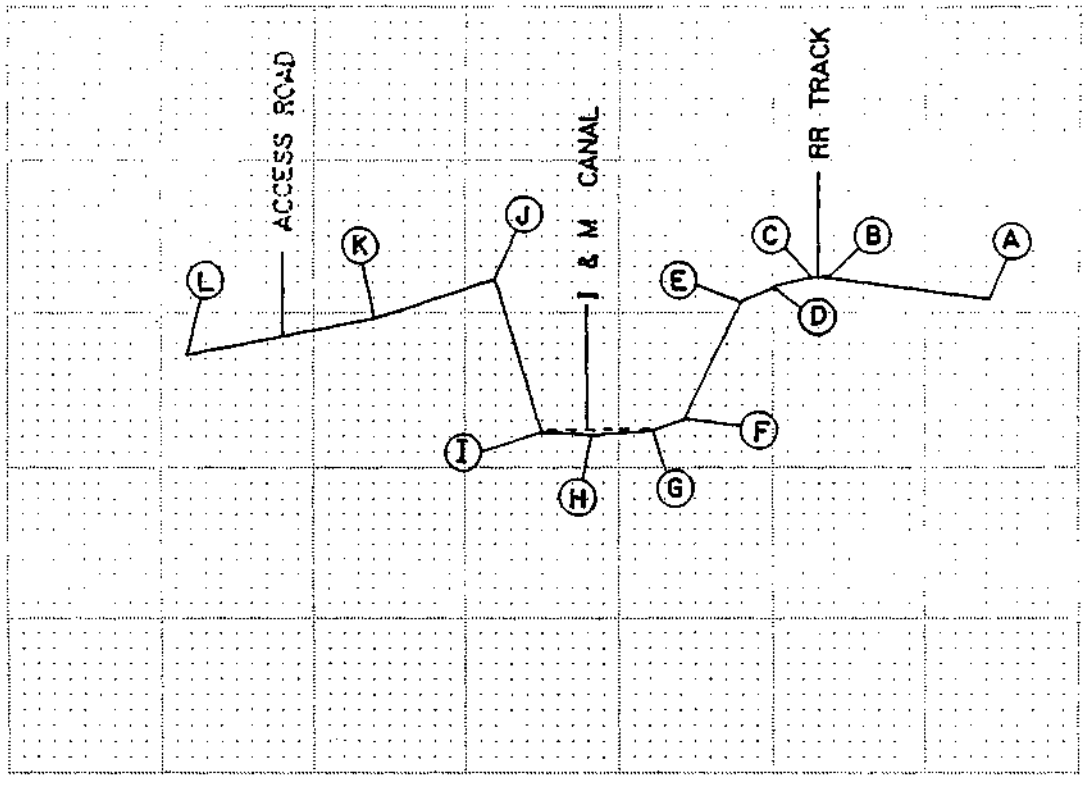
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P65

DATE 5-5-89

NO. 089-39-37 T

SECTION 14B



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+30	580.9			
B	4+83	582.2			
C	4+88	582.2			
D	5+00	581.7	1796782.776	575519.104	
E	5+10	580.7			
F	5+29	573.1			
G	5+38	572.4			
H	5+59	572.1			
I	5+75	572.2			
J	5+90	582.1	1796751.970	575434.567	SEE TIE SHEET 38 T
K	6+30	579.8			
L	6+92	577.3			

----INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929

Coordinates are based on the Illinois State Plane Coordinate System East zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

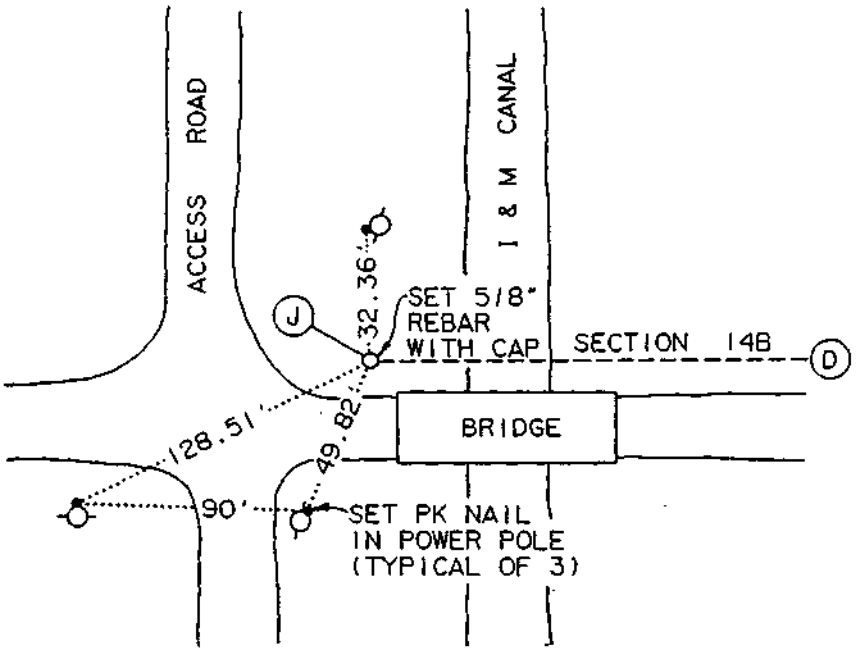
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P73

DATE 5-5-89

NO. 089-39-38

TIE DIAGRAM
SECTION 14B (WEST)

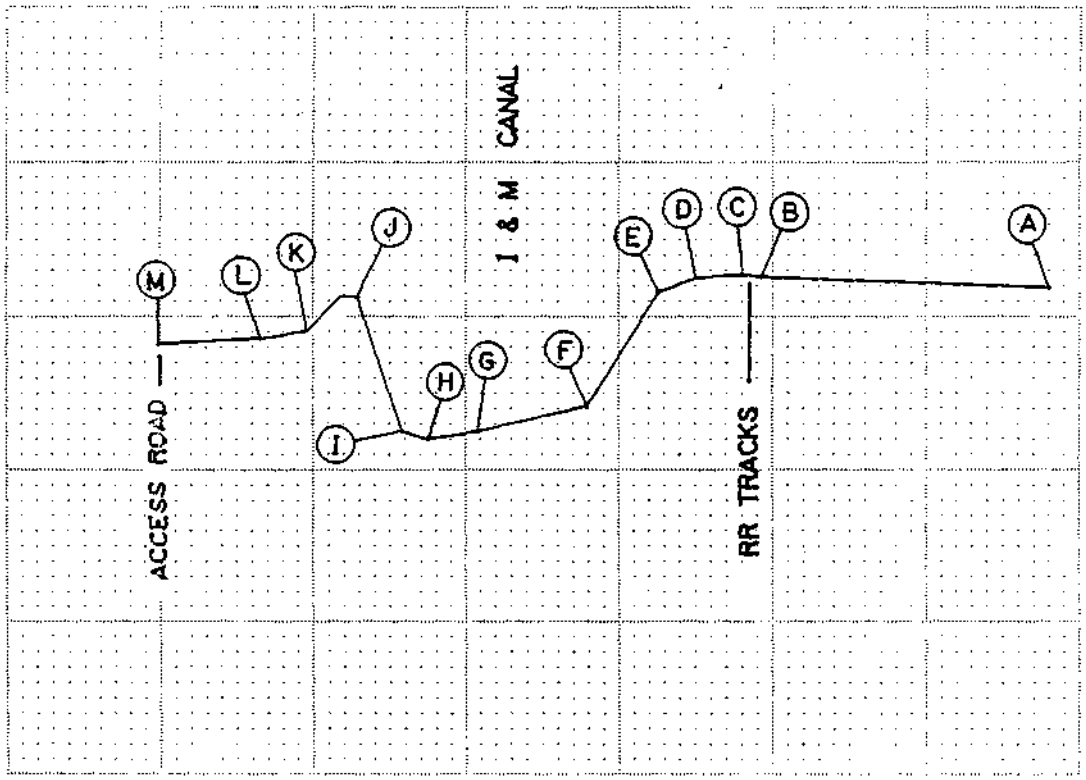


AZIMUTH = 69° 58' 40"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P66
DATE 5-5-89
NO. 089-39-38 T

SECTION 14C



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+05	581.8			
B	4+84	582.7			
C	4+89	582.8			
D	5+00	582.4	1796946.334	575461.546	
E	5+10	581.7			
F	5+28	574.2			
G	5+57	572.5			
H	5+70	572.0			
I	5+77	572.5			
J	5+88	581.2			
K	6+02	579.1			
L	6+14	578.6	1796909.350	575353.705	SEE TIE SHEET 39 T
M	6+41	578.2			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----- INDICATES WATER LEVEL

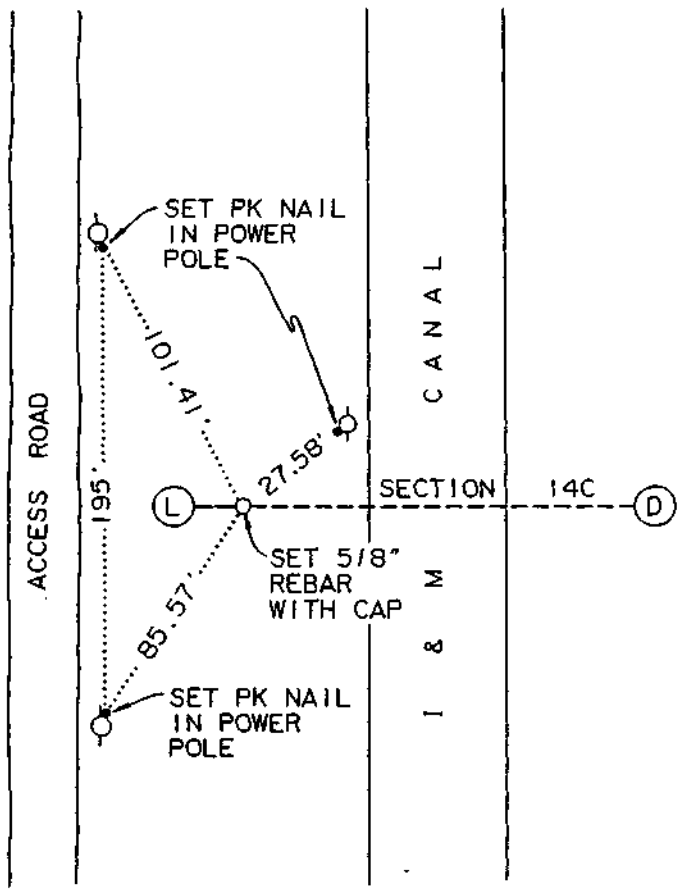
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBII P74

DATE 5-5-89

NO. 089-39-39

TIE DIAGRAM
SECTION 14C (WEST)



AZIMUTH = 71° 04' 15"

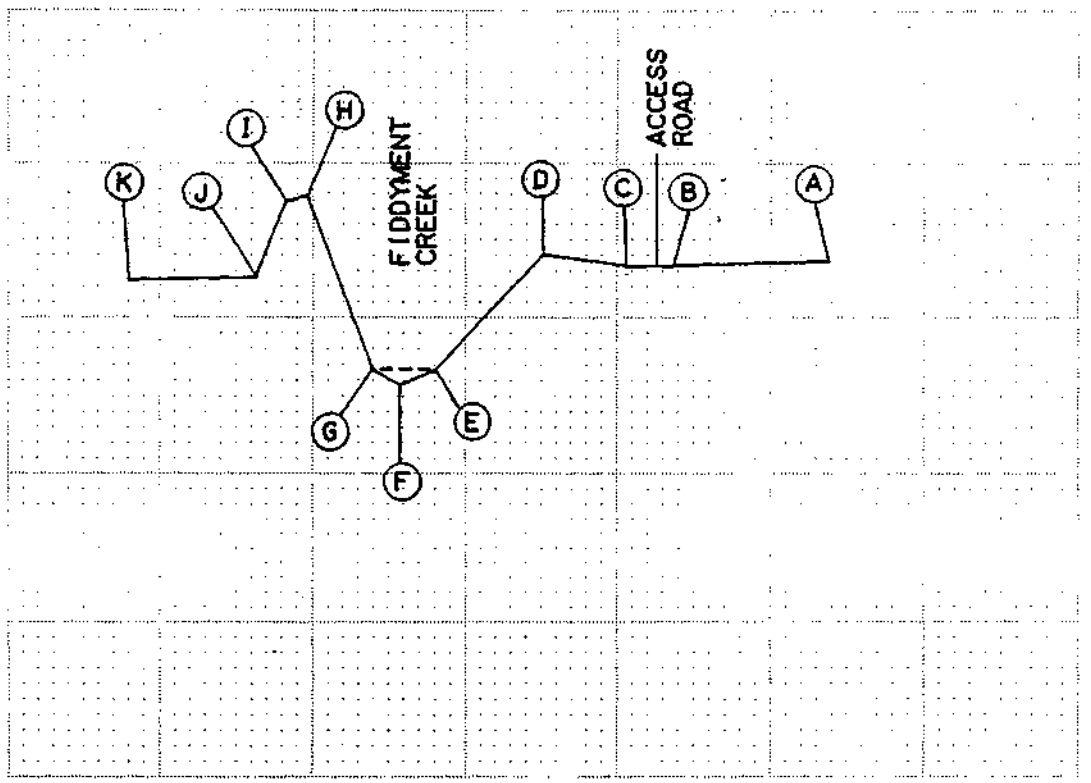
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBI P66

DATE 5-5-89

NO. 089-39-39 T

SECTION 15A



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+06	583.7			
B	4+57	583.4			
C	4+73	583.3			
D	5+00	584.1	1797183.860	575715.430	SEE TIE SHEET 40 T
E	5+35	576.7			
F	5+46	575.8			
G	5+56	576.8			
H	5+77	587.8	1797107.214	575713.215	
I	5+84	587.5			
J	5+94	582.6			
K	6+35	582.4			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

---- INDICATES WATER LEVEL

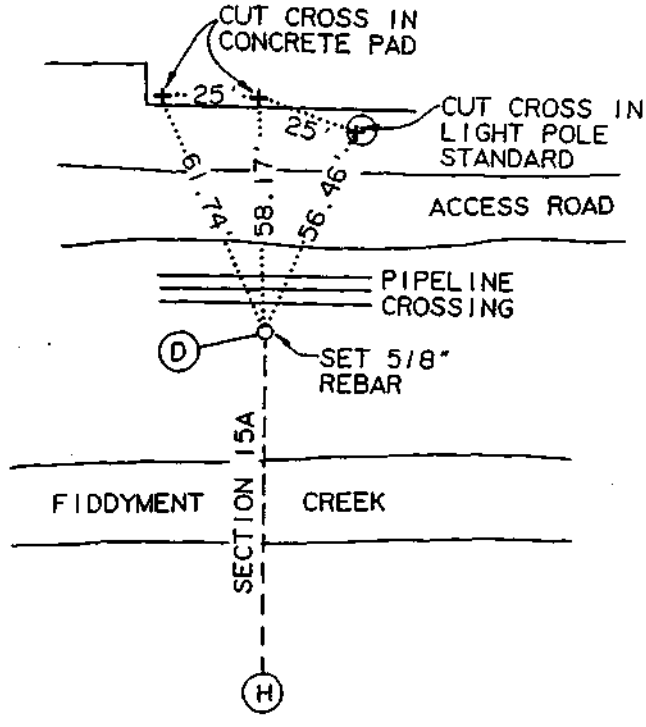
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P7

DATE 5-9-89

NO. 089-39-40

TIE DIAGRAM
SECTION 15A (NORTH)



AZIMUTH = 181° 39' 19"

N

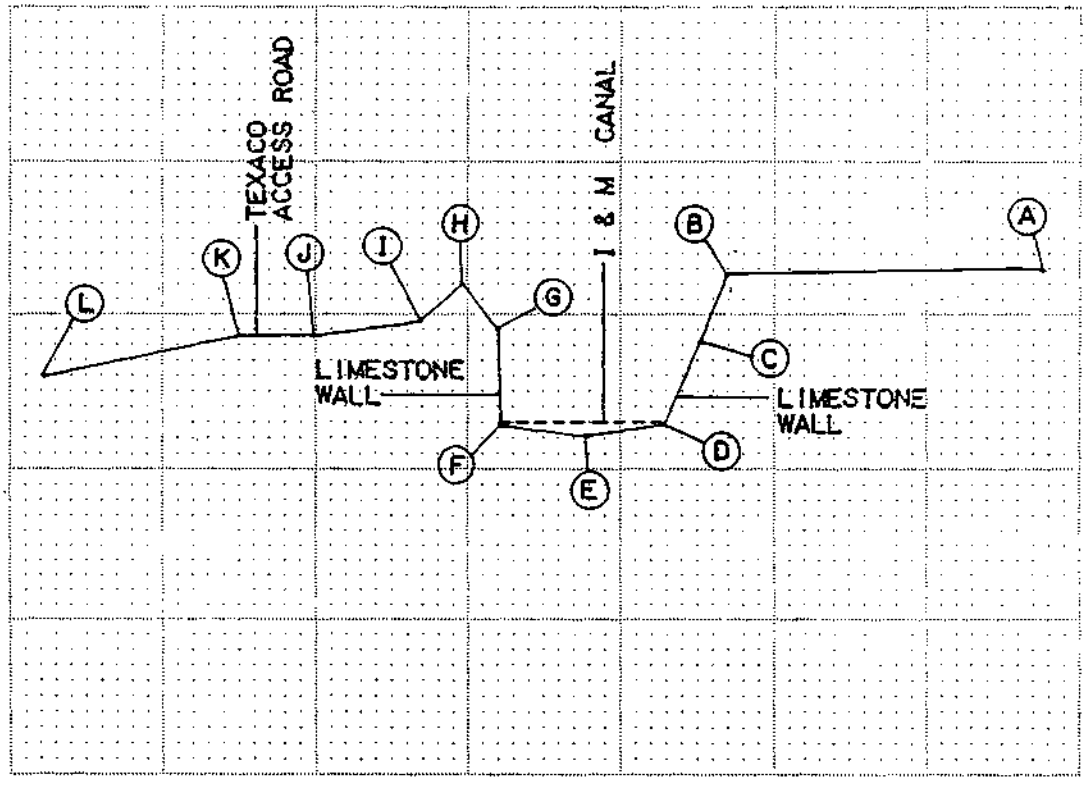
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P8

DATE 5-9-89

NO. 089-39-40 T

SECTION 17A



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	3+97	583.0			
B	5+00	582.6	1797253.910	575347.146	
C	5+14	578.2			
D	5+21	572.9			
E	5+47	572.2			
F	5+74	572.8			
G	5+76	579.0			
H	5+87	582.0	1797226.080	575264.777	SEE TIE SHEET 41 T
I	6+01	579.5			
J	6+36	578.6			
K	6+60	578.5			
L	7+25	575.9			

----- INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

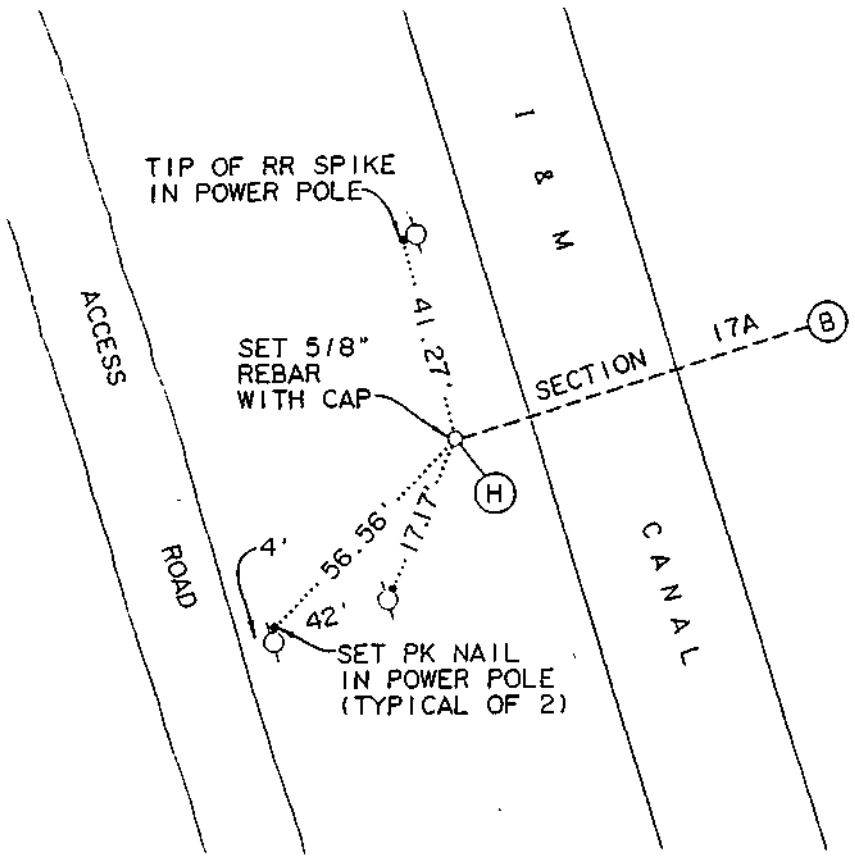
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P2

DATE 5-9-89

NO. 089-39-41

TIt DIAGRAM
SECTION 17A (WEST)

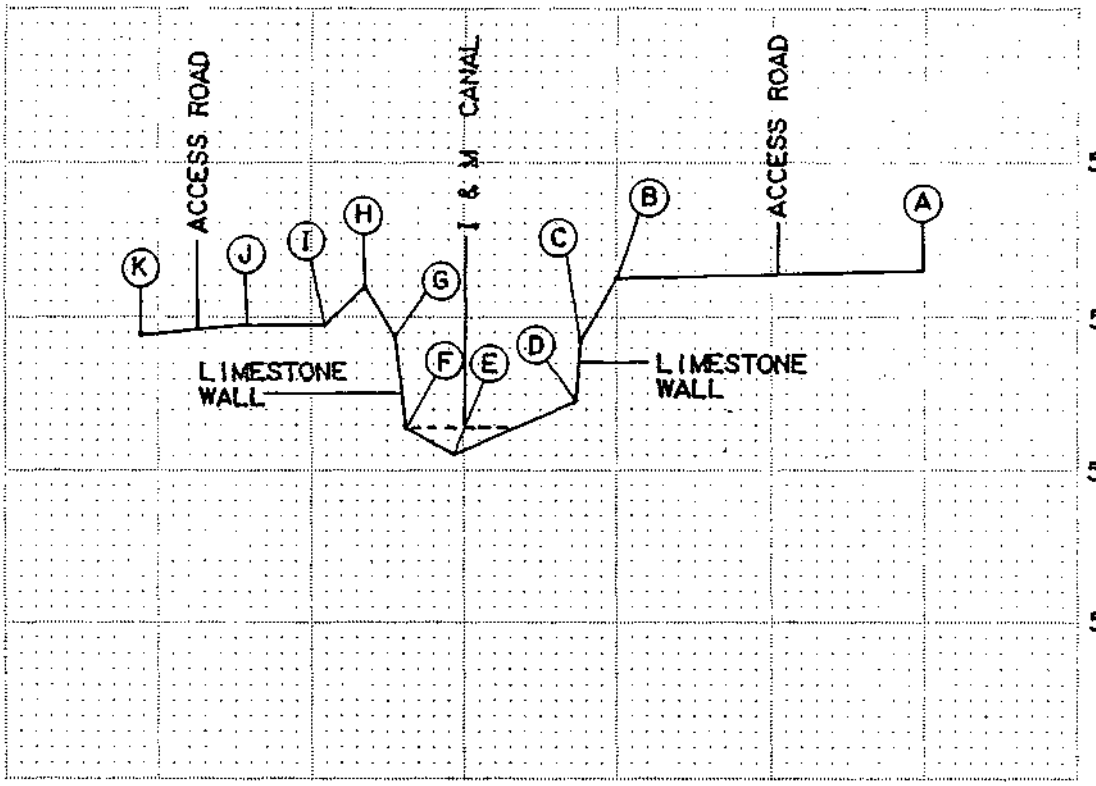


AZIMUTH = 71° 19' 53"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P3
DATE 5-9-89
NO. 099-39-41 T

SECTION 17B



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+01	583.1			
B	5+00	582.4	1797419.030	575284.473	
C	5+12	578.7			
D	5+14	574.5			
E	5+54	571.6			
F	5+69	572.8			
G	5+73	578.9			
H	5+83	581.9	1797395.100	575204.830	SEE TIE SHEET 42 T
I	5+96	579.4			
J	6+22	579.4			
K	6+56	578.8			

----INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

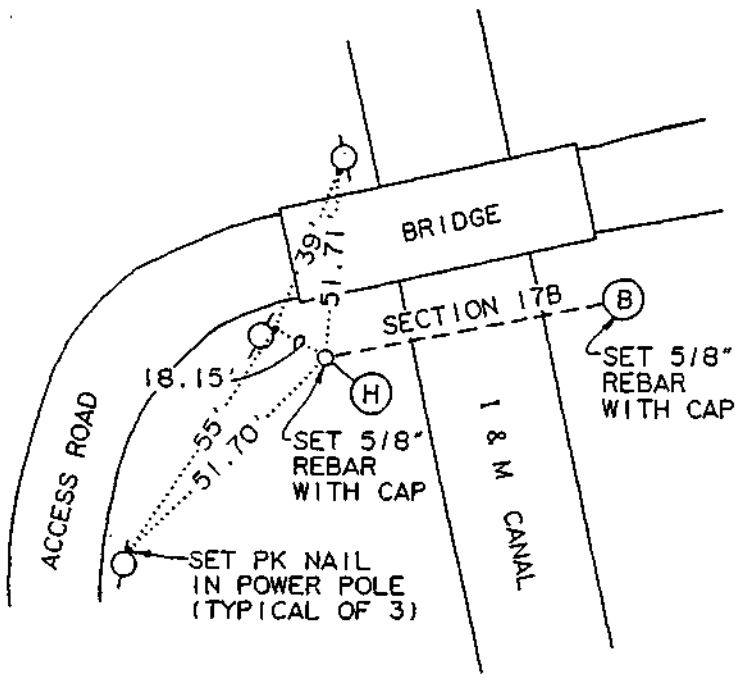
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P4

DATE 5-9-69

NO. 089-39-42

TIE DIAGRAM
SECTION 17B (WEST)

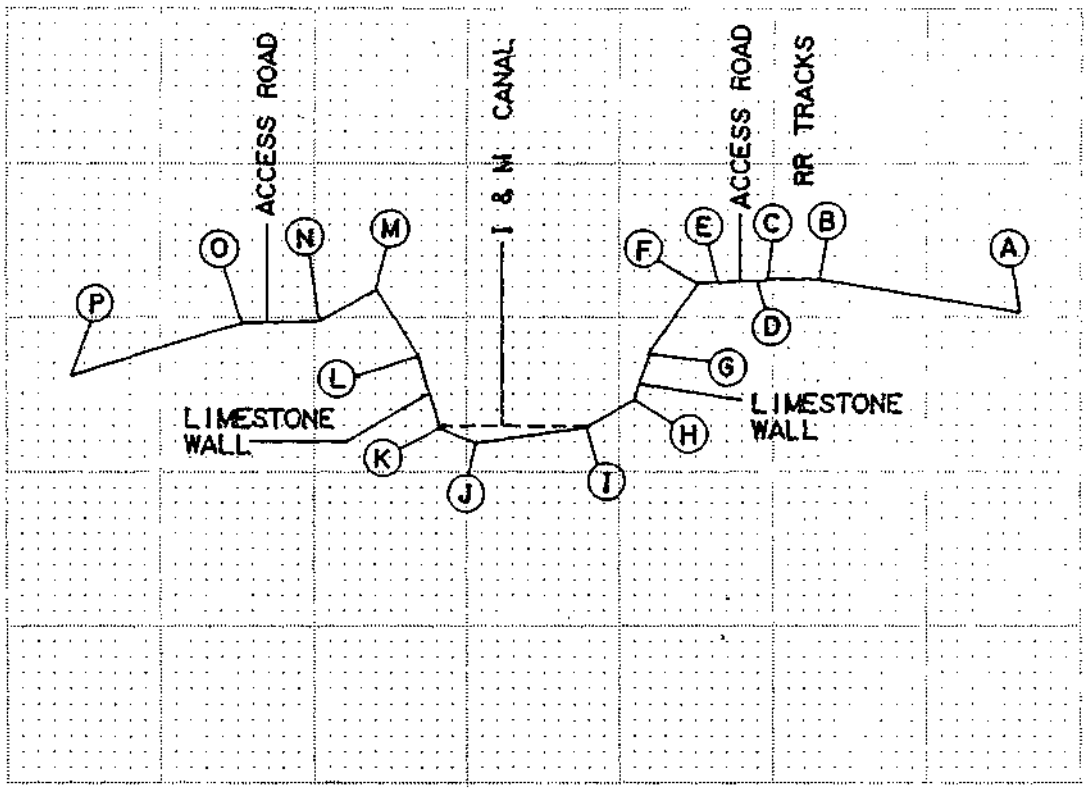


AZIMUTH = 73° 16' 35"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB III P3
DATE 5-9-89
NO. 089-39-42 T

SECTION 17C



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+16	580.4			
B	4+68	582.4			
C	4+81	582.6			
D	4+84	582.4			
E	4+95	582.2			
F	5+00	582.1	1797598.340	575222.550	
G	5+13	578.6			
H	5+16	574.7			
I	5+29	573.0			
J	5+57	572.0			
K	5+67	572.9			
L	5+72	577.5			
M	5+84	581.8	1797573.700	575142.761	SEE TIE SHEET 43 T
N	5+99	579.9			
O	6+19	579.6			
P	6+63	576.1			

----- INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidl & Associates for the U.S. Corps of Engineers.

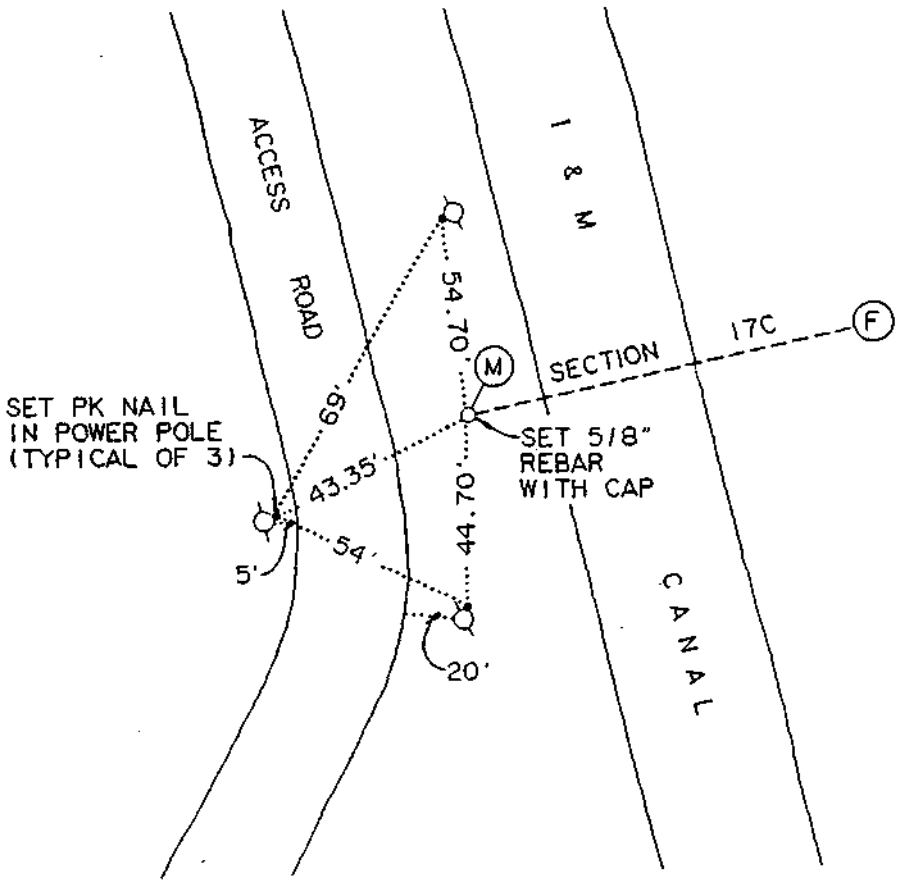
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P6

DATE 5-9-89

NO. 089-39-43

TIE DIAGRAM
SECTION 17C (WEST)

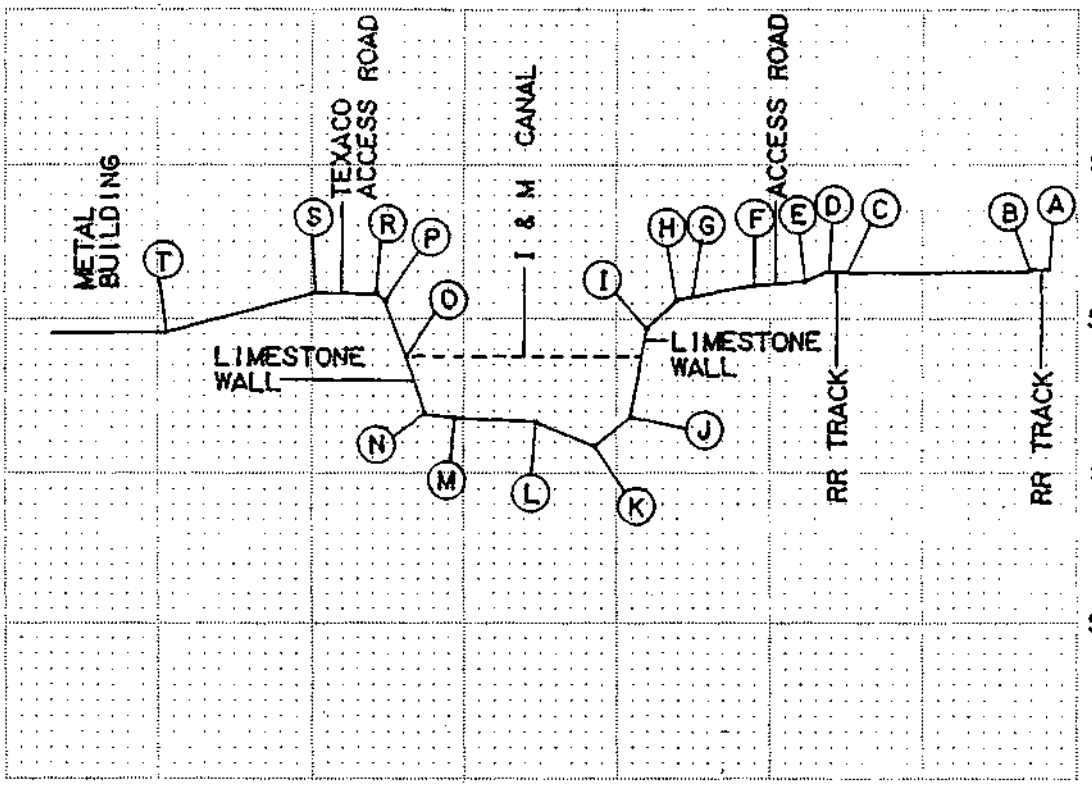


AZIMUTH = 72° 50' 19"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB III P6
DATE 5-9-89
NO. 089-39-43 T

SECTION 17D



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+07	583.1			
B	4+12	583.1			
C	4+60	583.0			
D	4+65	583.0			
E	4+71	582.3			
F	4+84	582.2			
G	5+00	581.7	1797856.100	575133.918	SEE TIE SHEET 44 T
H	5+05	581.1			
I	5+13	579.3			
J	5+16	573.6			
K	5+26	571.7			
L	5+41	573.3			
M	5+62	573.4			
N	5+70	573.8			
O	5+75	577.5			
P	5+81	581.1	1797831.350	575057.075	
R	5+83	581.5			
S	5+99	581.7			
T	6+38	579.1			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidl & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

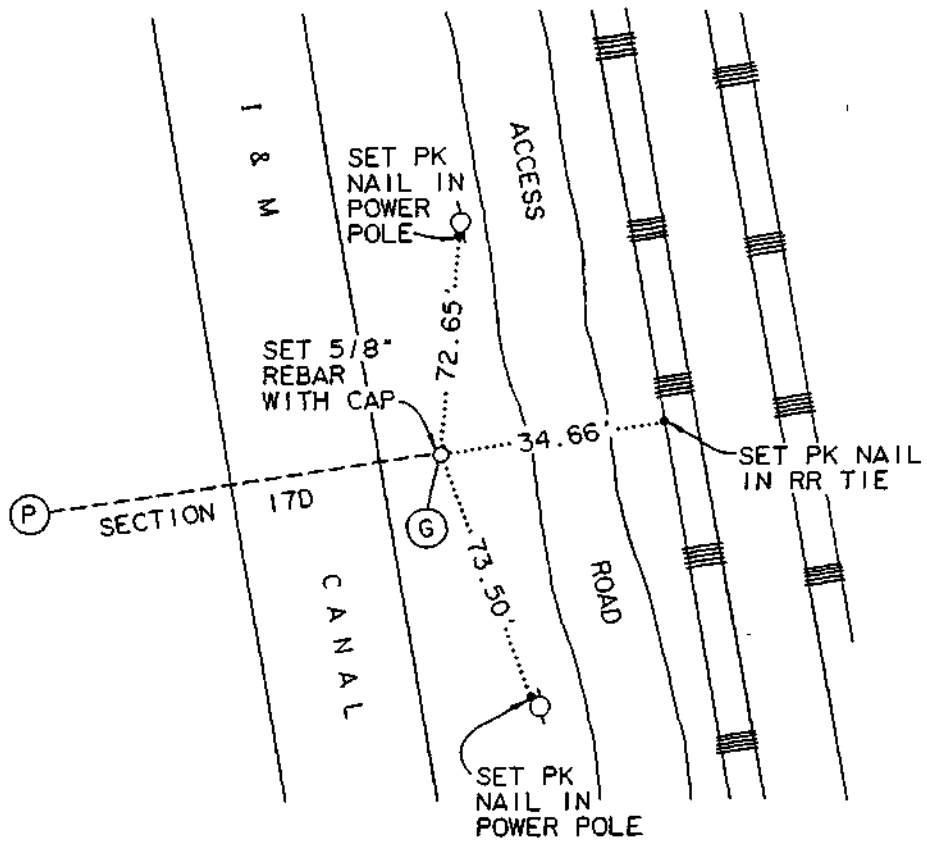
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII PIO

DATE 5-9-89

NO. 089-39-44

TIE DIAGRAM
SECTION 17D (EAST)

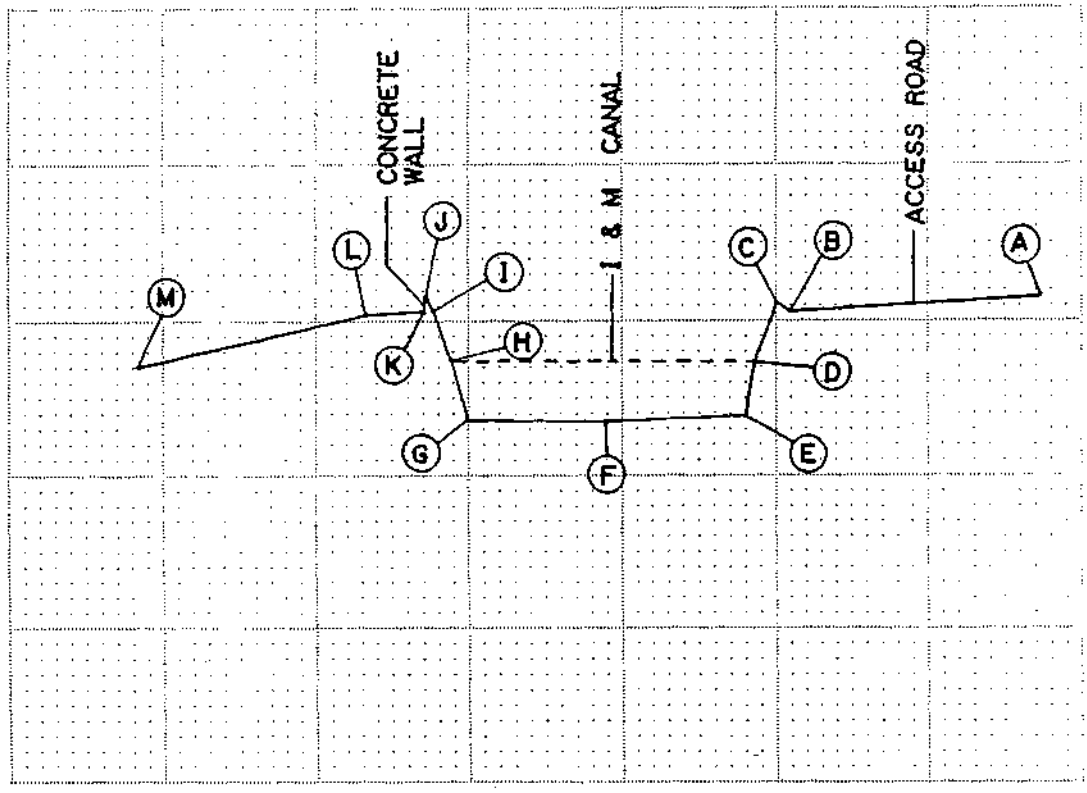


AZIMUTH = 72° 08' 49"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P11
DATE 5-9-89
NO. 089-39-44 T

SECTION 18A



MARK	LINE STATION	ELEVATION	COORDINATES N	E
A	4+13	581.5		
B	4+95	580.6		
C	5+00	581.1	1798247.190	575027.498
D	5+07	577.4		
E	5+10	573.8		
F	5+55	573.5		
G	6+00	573.6		
H	6+06	577.4		
I	6+12	580.7	1798215.700	574919.700
J	6+14	581.6		
K	6+15	580.7		
L	6+34	580.3		
M	7+10	577.1		

SEE TIE SHEET 45 T

----- INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

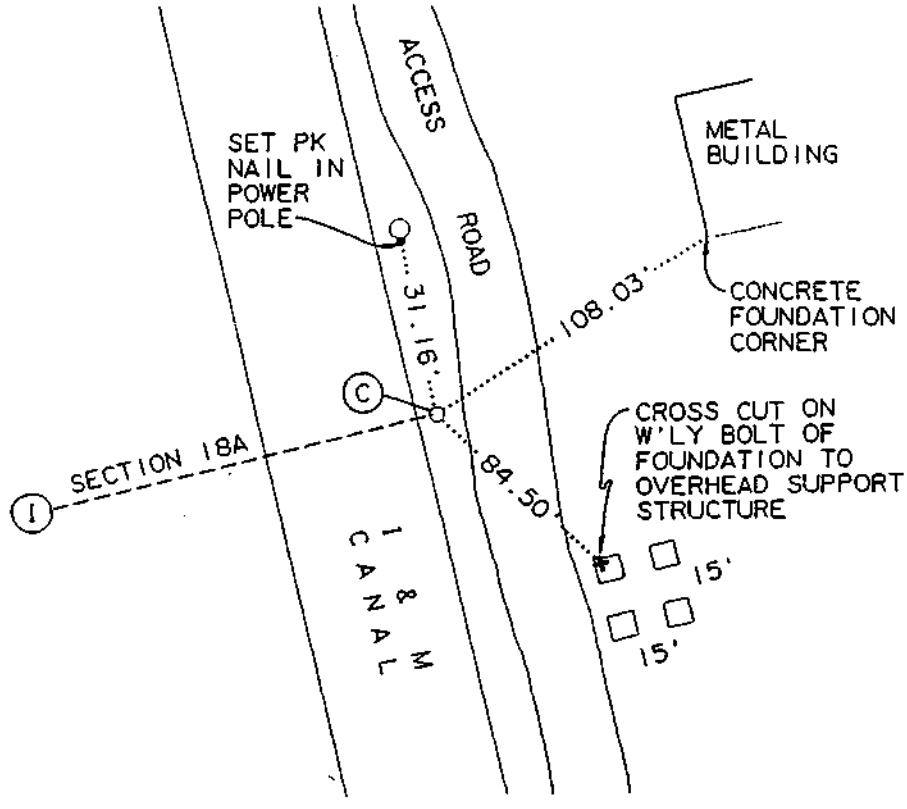
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P12

DATE 5-9-89

NO. 089-39-45

TIE DIAGRAM
SECTION 18A (EAST)

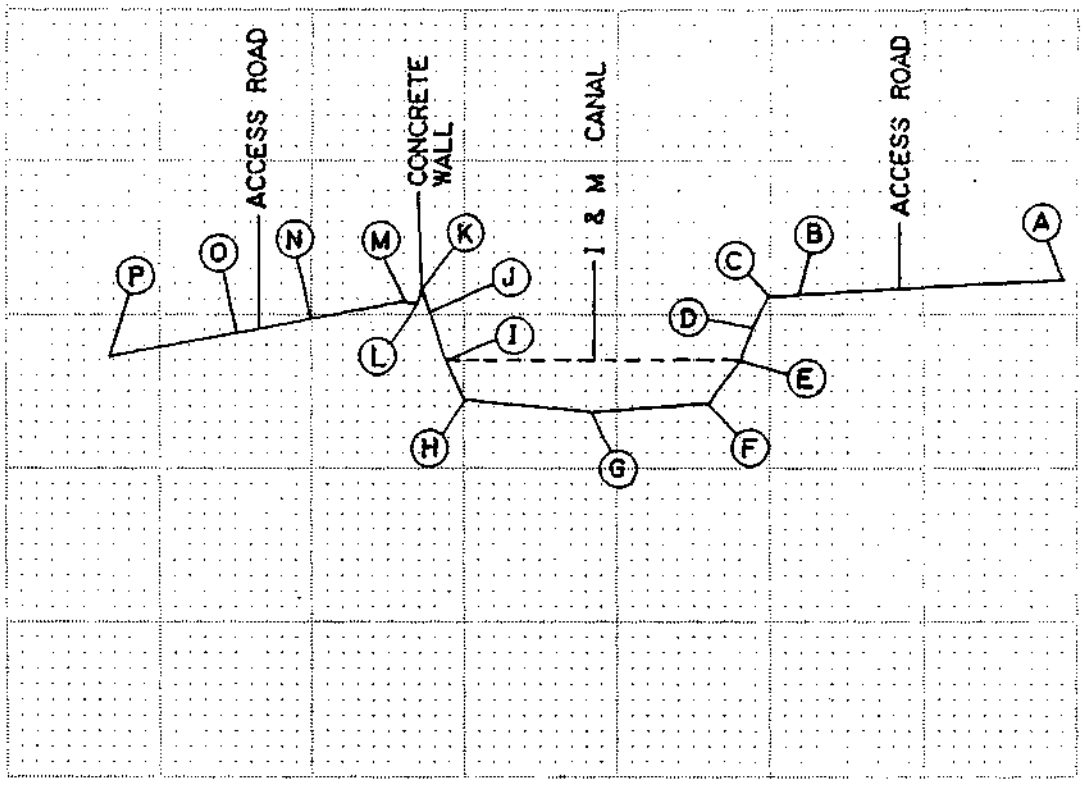


AZIMUTH = 73° 42' 57"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P13
DATE 5-9-89
NO. 089-39-45 T

SECTION 18B



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+02	582.3			
B	4+92	581.5			
C	5+00	581.3	1798411.140	574970.945	SEE TIE SHEET 46 T
D	5+06	579.1			
E	5+09	577.3			
F	5+20	574.2			
G	5+60	573.8			
H	6+00	574.3			
I	6+07	577.3			
J	6+12	580.2			
K	6+14	581.6			
L	6+15	580.7			
M	6+19	580.8	1798378.870	574855.922	
N	6+50	579.8			
O	6+75	578.9			
P	7+18	577.0			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----- INDICATES WATER LEVEL

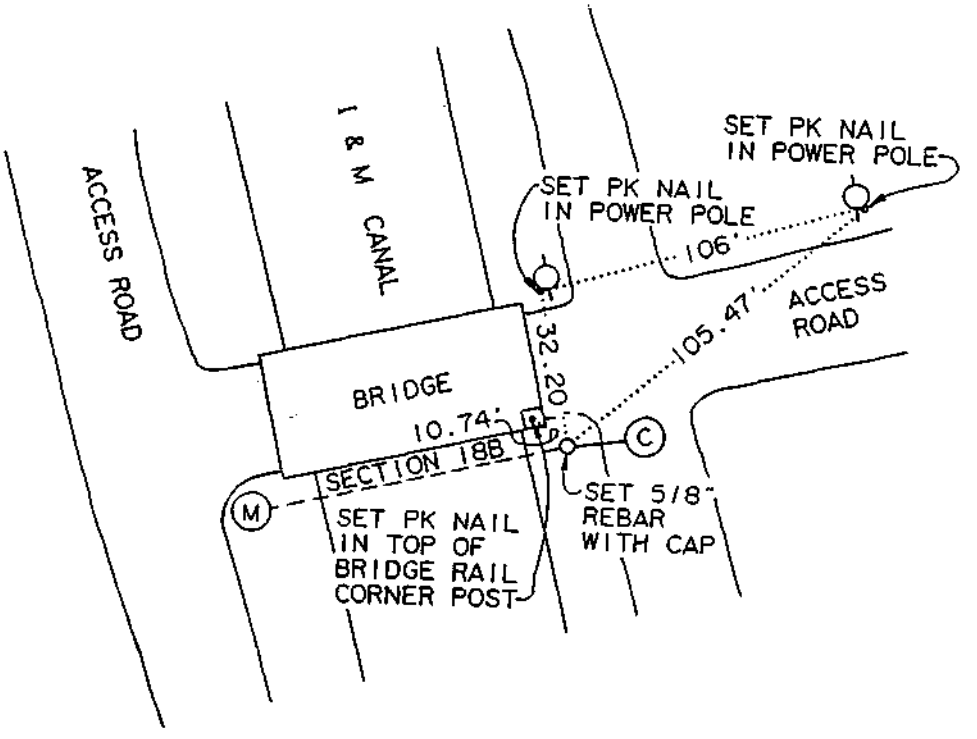
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P15

DATE 5-10-89

NO. 089-39-46

T1E DIAGRAM
SECT10N I8B (EAST)

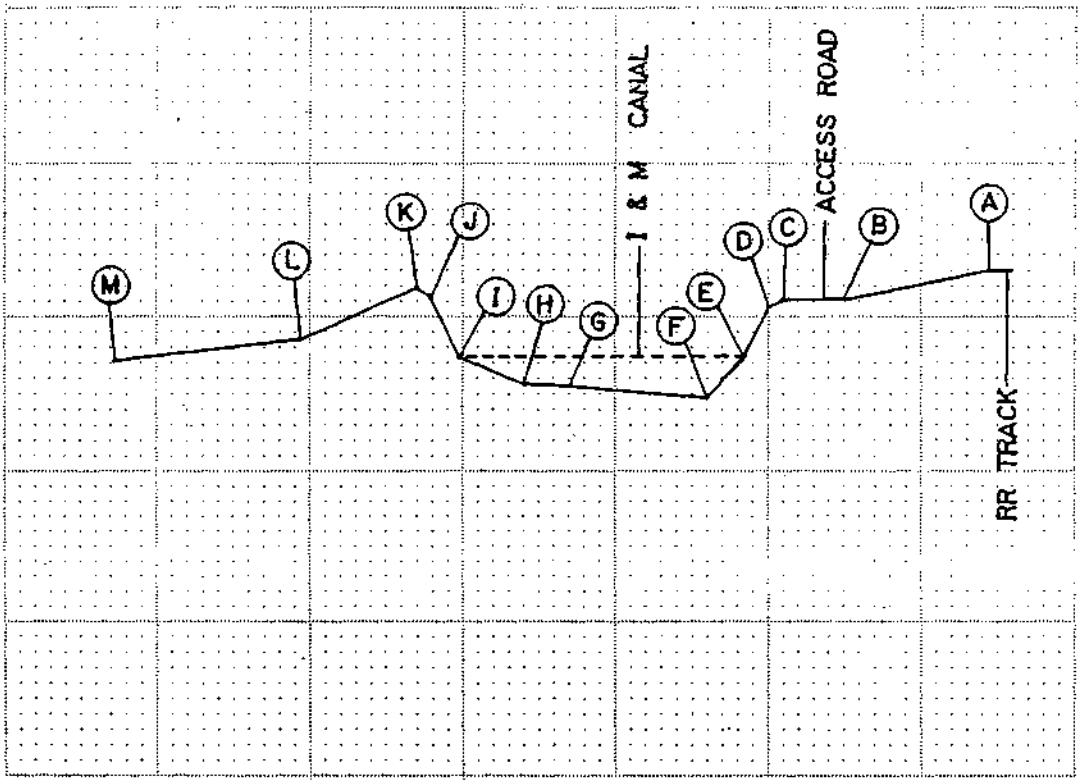


AZIMUTH = 74° 19' 42"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P15
DATE 5-10-89
NO. 089-39-46 T

SECTION 18C



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+28	582.9			
B	4+75	581.2			
C	4+95	581.1			
D	5+00	580.6	1798633.660	574890.461	SEE TIE SHEET 47 T
E	5+08	577.4			
F	5+20	574.7			
G	5+65	575.4			
H	5+80	575.6			
I	6+02	577.2			
J	6+11	581.3			
K	6+16	581.8	1798590.940	574783.019	
L	6+53	578.6			
M	7+14	577.1			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

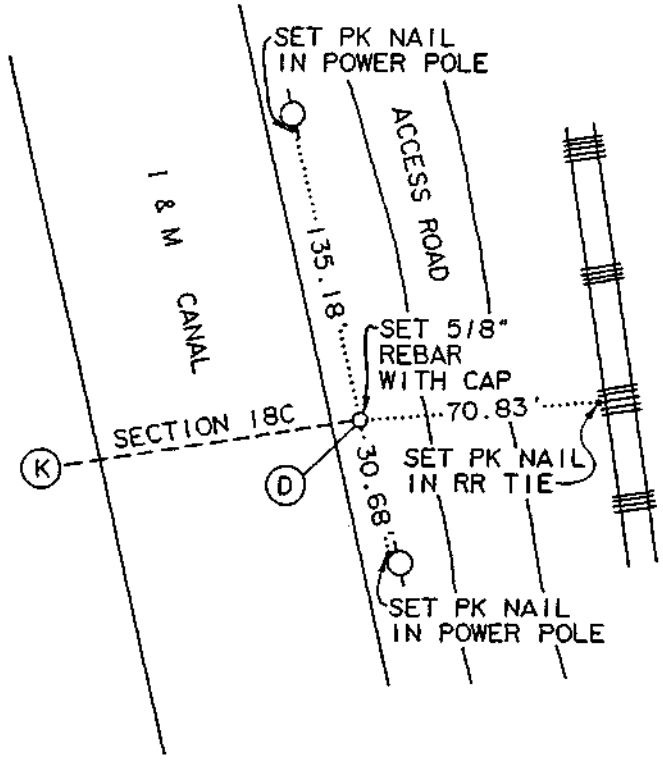
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB101 P21

DATE 5-10-89

NO. 089-39-47

TIE DIAGRAM
SECTION 18C (EAST)

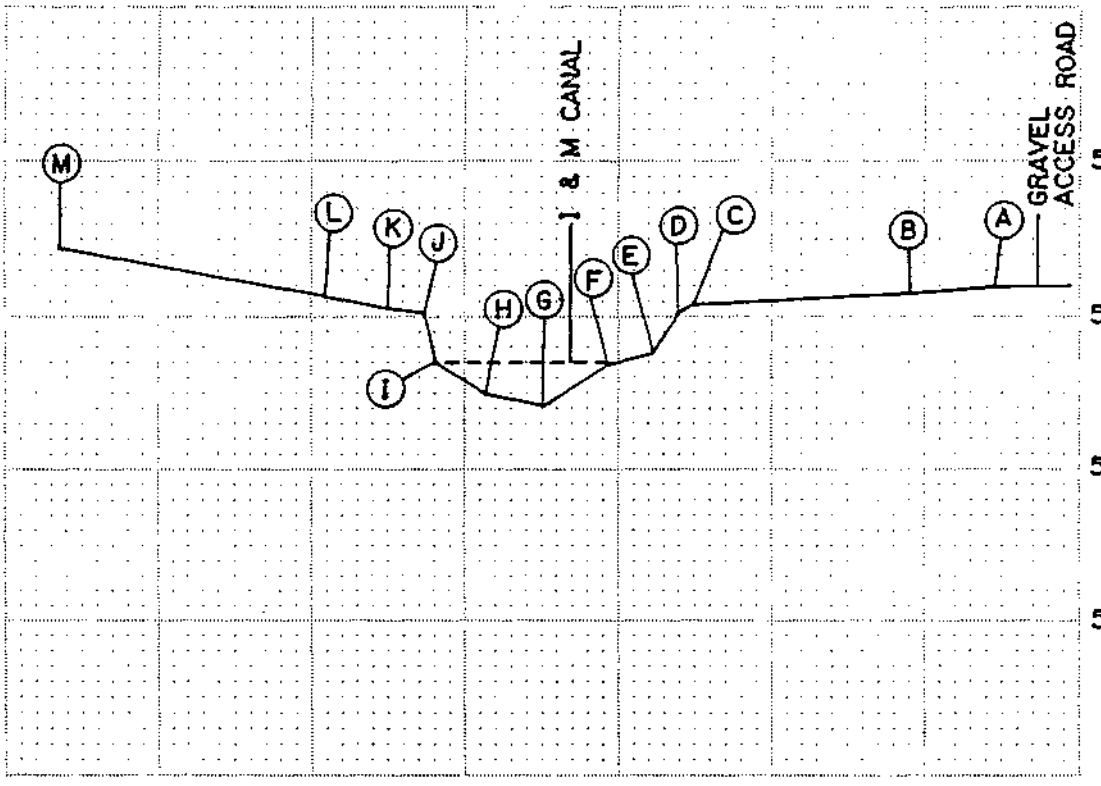


AZIMUTH = 68° 19' 00"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB 111 P22
DATE 5-10-89
NO. 089-39-47 T

SECTION 19A



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+22	582.0			
B	4+44	581.5			
C	5+00	580.8	1801113.630	574482.092	SEE TIE SHEET 48 T
D	5+04	580.2			
E	5+11	577.6			
F	5+23	576.9			
G	5+40	574.2			
H	5+55	574.9			
I	5+68	577.0			
J	5+71	580.1			
K	5+80	580.6	1801112.300	574400.916	
L	5+97	581.3			
M	6+66	584.4			

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

----INDICATES WATER LEVEL

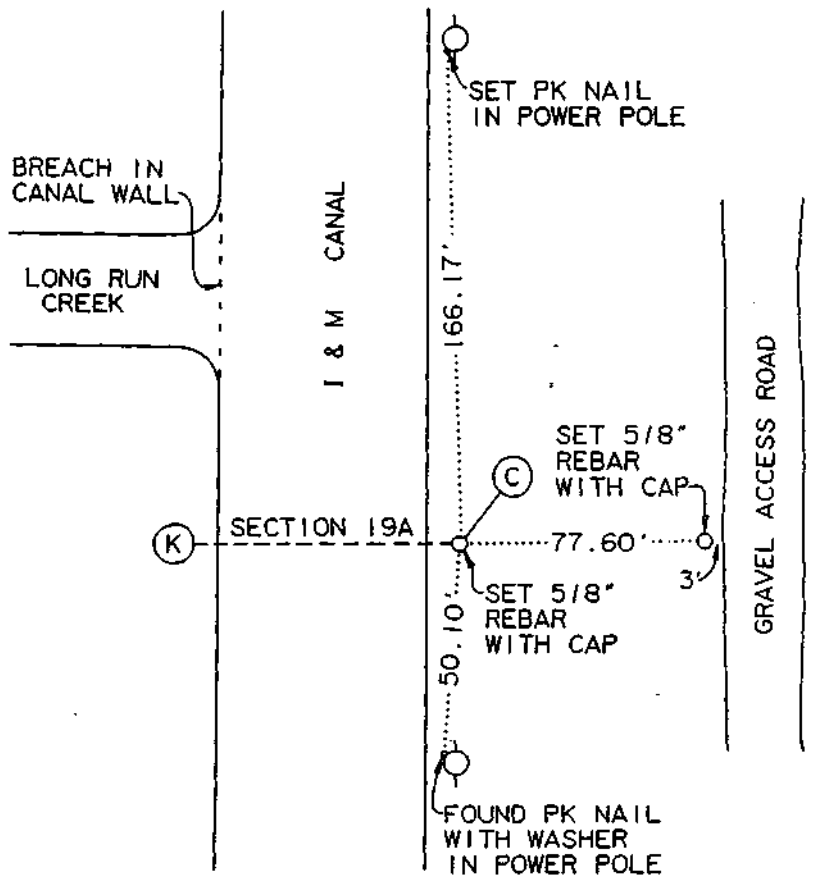
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P20

DATE 5-10-89

NO. 089-39-48

TIE DIAGRAM
SECTIOM 19A (EAST)

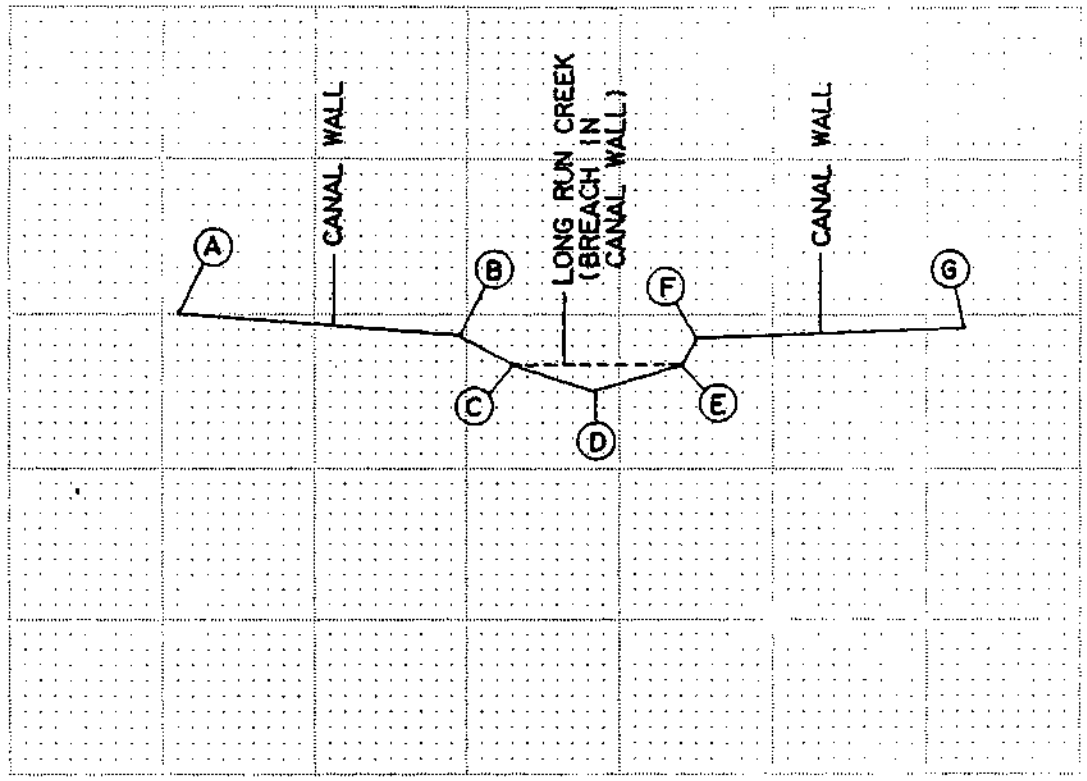


AZIMUTH = 89° 03' 41"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB111 P20
DATE 5-10-89
NO. 089-39-48 T

SECTION 19B



MARK	LINE STATION	ELEVATION	COORDINATES N	E
A	5+02	580.1		
B	5+39	578.8		
C	5+46	576.8		
D	5+57	575.0		
E	5+68	576.9		
F	5+70	578.5		
G	6+05	579.2		

NO TIES TAKEN

----- INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

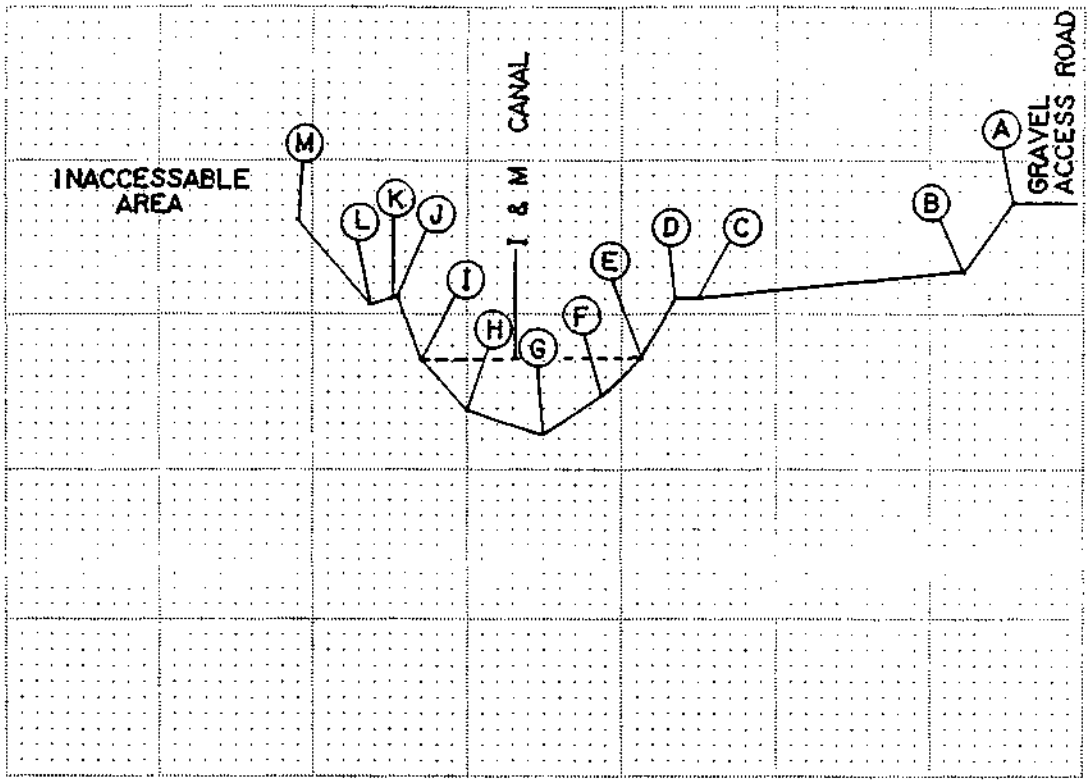
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P20

DATE 5-10-89

NO. 089-39-49

SECTION 20A



MARK	LINE STATION	ELEVATION	COORDINATES N	E
A	4+18	587.2		
B	4+31	582.7		
C	5+00	581.0	1803603.854	574678.535
D	5+06	581.0		
E	5+15	577.1		
F	5+25	574.8		
G	5+40	572.2		
H	5+60	573.8		
I	5+72	577.1		
J	5+78	581.2		
K	5+79	581.0	1803610.340	574599.341
L	5+85	580.7		
M	6+14	586.1		

SEE TIE SHEET 50 T

----INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidl & Associates for the U.S. Corps of Engineers.

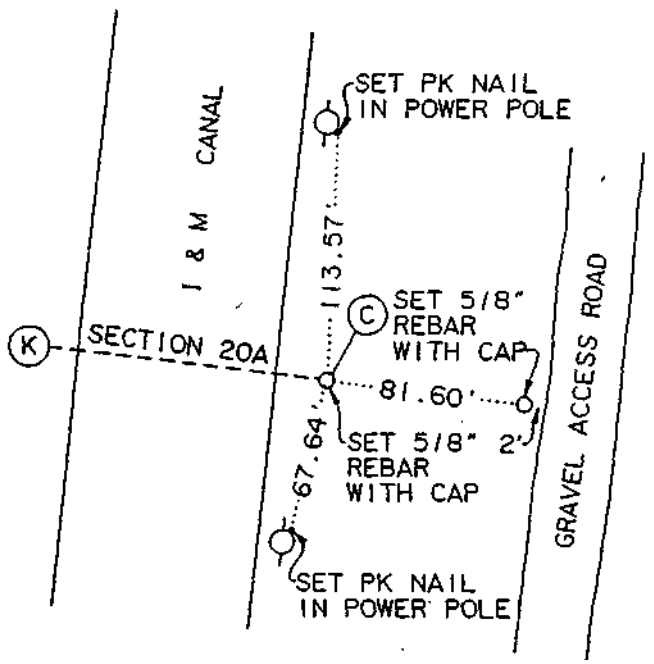
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P18

DATE 5-10-89

NO. 089-39-50

TIE DIAGRAM
SECTION 20A (EAST)

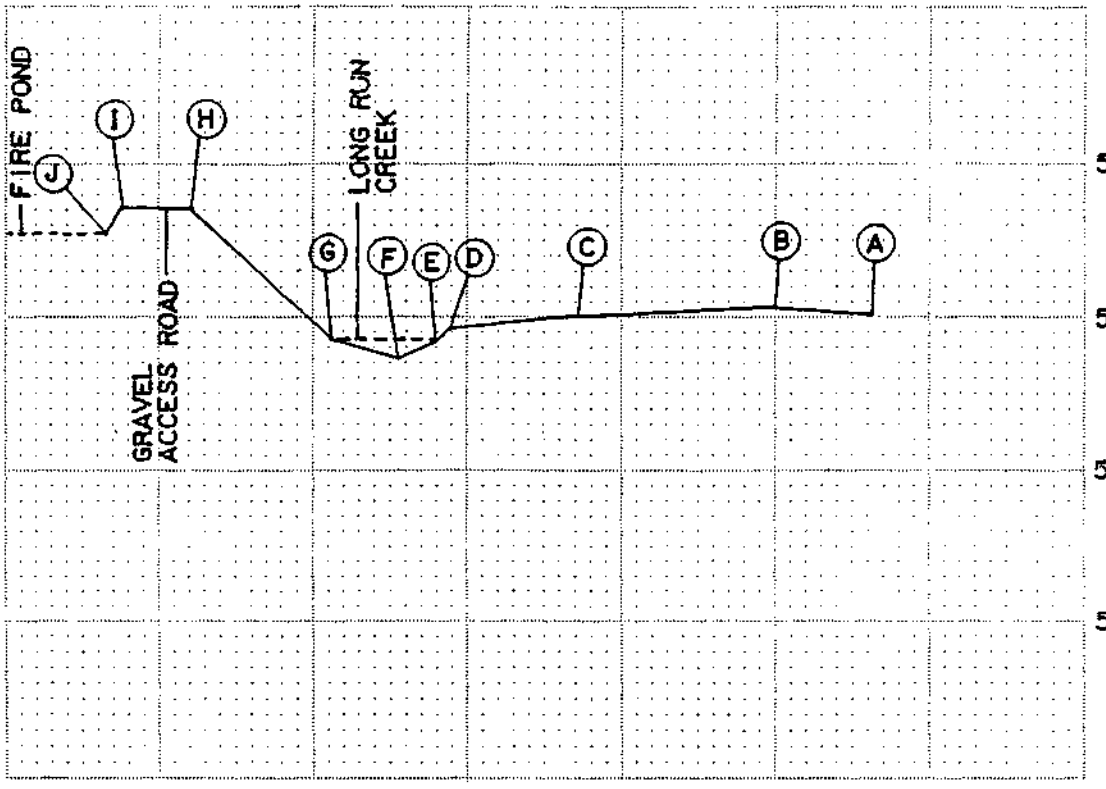


AZIMUTH = 94° 40' 55"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB111 P12
DATE 5-10-89
NO. 089-39-50 T

SECTION 21A



MARK	LINE STATION	ELEVATION	COORDINATES N	E	
A	4+75	580.1			
B	5+00	580.6			
C	5+51	580.1			
D	5+84	579.2			
E	5+87	578.3			
F	5+97	577.3			
G	6+15	578.5			
H	6+51	587.1	1803994.540	574995.233	SEE TIE SHEET 51 T
I	6+69	587.2			
J	6+74	585.3			

----INDICATES WATER LEVEL

National Geodetic Vertical Datum of 1929.

Coordinates are based on the Illinois State Plane Coordinate System East Zone as established by A.R. Schmidt & Associates for the U.S. Corps of Engineers.

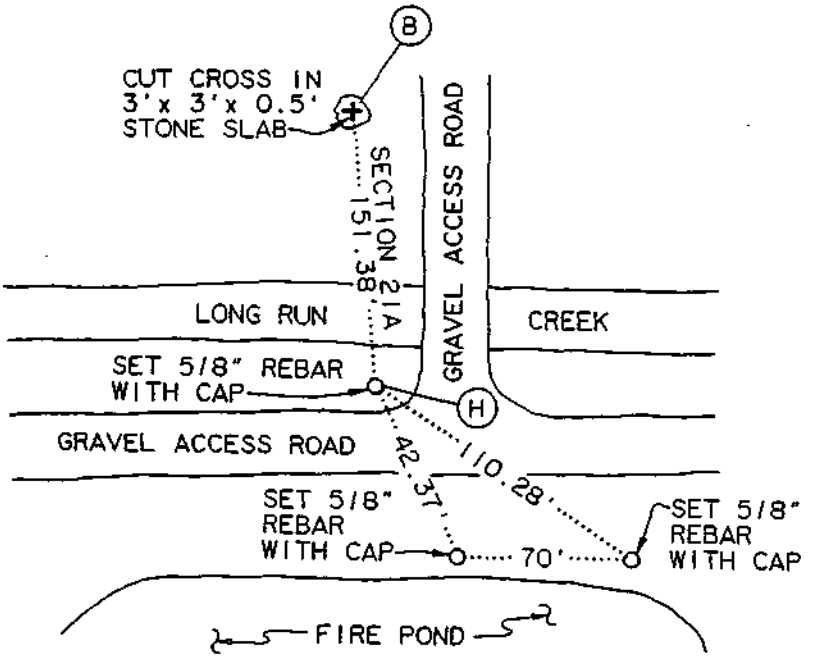
BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FBIII P16

DATE 5-10-89

NO. C89-39-51

TIE DIAGRAM
SECTION 21A (SOUTH)



AZIMUTH = 170° 40' 45"

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

FB111 P16
DATE 5-10-89
NO. 089-39-51 T

I & M BENOH MARKS

SECTION GROUP 1

BM-B7 ELEV. 559.05

A CUT TRIANGLE AND DRILL HOLE ON TOP OF THE EAST END OF THE NORTHWEST BRIDGE SEAT TO THE AT&SF RR BRIDGE OVER THE I & M CANAL. USCE STATION 288.9

SECTION CROUP 2

BM-B6 ELEV. 517.67

THE TOP OF A RR SPIKE SET IN THE WEST FACE OF THE NORTHERLY OF TWO POWER POLES, IN THE FIRST POWER LINE CROSSING THE I & M CANAL SOUTH OF THE EJ&E RR BRIDGE OVER THE CANAL, ON THE WEST BANK OF THE CANAL.

SECTION CROUP 3

BM-B5 ELEV. 573.49

THE TOP OF ANCHOR BOLT IN SOUTHEAST FOUNDATION OF OLD RH SIGNAL, JUST EAST OF JUNCTION OF EJ&E AND AT&SF RAILROADS, EAST OF THE EJ&E BRIDGE OVER THE ILLINOIS WATERWAY. (SIGNAL REMOVED)

SECTION GROUP 4

BM-B3 ELEV. 561.24

A SQUARE CUT IN THE WEST SIDE OF THE FIRST NORTHERLY BRIDGE PIER FOUNDATION OF THE SINGLE LANE AUTO BRIDGE RUNNTNG FROM COLLINS STREET TO THE JUNK YARD, WEST OF THE I & M CANAL.

National Geodetic Vertical Datum of 1929

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

DATE June 8, 1989

NO. 089-39-52-BM

SECTION GROUP 5

BM-B2 ELEV.563.35

THE TOP OF A RH SPIKE SET IN THE WEST FACE OF A POWER POLE, 1 FOOT ABOVE GRADE, 130 FEET WEST OF THE MOST NOHTHERLY CONCRETE SECTION OF THE WEST END OF THE SINGLE LANE AUTO BRIDGE RUNNING, FROM COLLINS STREET TO THE JUNK YARD.

SECTION GROUP 8

NGS BM-TBM 438(USE) ELEV. 569.047

THE HIGHEST POINT WITHIN AN OLD CHISELEÜ SQUARE AT LOCK 2 OF THE 1 & M CANAL, ON THE TOP OF THE WEST WALL, 0.3 FOOT HACK FROM THE EAST FACE OF THE TAIL BAY TO THE LOCK CHAMBER, AND 0.6 FOOT SOUTH OF THE SOUTH SIDE OF THE QU01N POST RECESS OF THE LOWER WEST GATE. SURROUNDED BY THE LETTERS "SDPBM". SQUARE AND LETTERS HAVE BECOME VERY FA.1NT WITH AGE.

SECTION GROUP 7

BM-B8 ELEV. 570.52

A CROSS CUT ON THE SOUTHWEST CORNER OF THE NORTHERLY ABUTMENT OF THK ICG RR BRIDGE OVEH FRACTION RUN CREEK AT DELLWOOD PARK.

SECTION GROUP 8

BM-B9 ELEV. 573.94

THE TOP OF THE NORTHWESTERLY ANCHOR BOLT FOR THE RIKE PATH CROSS-ING SIGNAL, EAST OF THE ICG RR TRACKS AND NORTH OF DELLWOOD PARK.

National Geodetic Vertical Datum of 1929.

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2697

DATE June 8, 1989

NO. 089-39-53-BM

SECTION GROUP 9

BM-B10 ELEV. 581.83

A SQUARE CUT ON THE TOP OF THE NORTHEAST CORNER OF THE NORTHERLY CONCRETE RAILING OF THE DIVISION STREET BRIDGE OVER THE I & M CANAL.

SECTION GROUP 10

NGS BM-SD 116(USE) ELEV. 60].734

A COPPER BOLT LEADED VERTICALLY IN THE NORTH WATER TABLE OF THE TWO-STORY BRICK BUILDING ON THE SOUTHEAST CORNER OK THE INTER-SECTION OF STATE AND NINTH STREETS, 21.7 FEET WEST OF THE NORTH-EAST CORNER OFTHE BUILDING. STONE MARKE!) FAINTLY "SD".

SECTION GROUP 11

BM-B14 ELEV. 588.71

TUE TOP OF THE NORTHEAST ANCHOR HOLT OF THE RAILROAD SIGNAL WEST OF THE ICG RR TRACKS AND SOUTH OF THE WALKWAY TO THE GAYLORD BUILDING.

SECTION GROUPS 12, 13, AND 14

BM-B17 ELEV. 578.11

A CROSS CUT IN THE SOUTHEAST CORNER OF A 2 FOOT BY 3 FOOT ABAN-DONED UTILITY BOX FOUNDATION, EAST OF THE NORTHERLY GATE AT THE MAIN ENTRANCE TO TEXACO ON SECOND STREET AND SOUTH OF THE FENCE.

National Geodetic Vertical Datum of 1929.

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

DATE June 8, 1989

NO. 089-39-54 -BM

SECTION GROUPS 15 AND 17

BM-B18 ELEV. 582.62

THE TOP OK A RH SPIKE SET IN A POWER POLK, APPROXIMATELY 150 FEET SOUTH OF THE SECOND BRIDGE NORTH OF SECOND STREET, ON THE WEST BANK OF THE I & M CANAL.

SECTION GROUP 16

BM-B23 ELEV. 579.48

THE TOP OF A RR SPIKE SET IN THE THIRD POWER POLE NORTH OF WEST THIRD STREET ON THE WEST SIDE OF STATE STREET.

SECTION GROUP 18

BM-B19 ELKV.582.66

THE TOP OF A RR SPIKE SET IN A POWER POLE JUST NORTH OF THE THIRD BRIDGE, NORTH OF SECOND STREET ON THE WEST BANK OK THE I & M CANAL.

SECTION GROUP 19

BM-B20 ELEV. 581.32

A CROSS CUT IN CONCRETE FOUNDATION FOR MONITORING PIPE NEAR SECTION GROUP 19, EAST OF THE I & M CANAL. APPROXIMATELY 100 FEET NORTH OF POWER POLE NO. 55/1863

SECTION GROUPS 20 AND 21

BM-H21 ELEV 587.53

A CROSS CUT IN THE NORTHEASTERLY CORNER OF THE CONCRETE RETAINING WALL FOR THK WATER GAUGE STATION AT THE NORTHWEST CORNER OF THK MOST NORTHERLY FIRE PQND AT TEXACO.

National Geodecic Vertical Datum of 1929.

BAIRD & COMPANY
LAND SURVEYORS
AT THE HISTORIC RAILROAD DEPOT
133 WEST THIRTEENTH STREET
LOCKPORT, ILLINOIS 60441
(815) 838-2897

DATE June 8, 1989

NO. 089-39-55-BM